ARGUS

DC Power Solutions

TOTAL POWER SOLUTIONS BY ARGUS TECHNOLOGIES

member of The alpha Group™

Power

ARGUS

Argus Technologies

Company Overview

Argus Technologies specializes in the design and manufacture of premium quality DC power solutions for the global communications industry. Since 1986, Argus has been recognized as an industry leader in the telephony market, and is leading the way in wireless technology today.

In addition to complete custom power systems, Argus products include enclosures, rectifiers, converters, and system controllers featuring remote and local monitoring.

Sales and service is available though a network of dedicated centers worldwide. Argus offers EF&I, training, 24/7 technical support (on and off line), and e-solutions.

The Alpha Group

The Alpha Group represents an alliance of independent companies who share a common philosophy – to create world class powering solutions.

Collectively, Alpha Group members develop and manufacture AC and DC power conversion protection, and standby products. Applications for these products include broadband, telecom, AC/UPS, commercial, industrial, and distributed generation, for a worldwide customer base. In addition, our companies provide a range of installation and maintenance services.

Members of The Alpha Group include Alpha Technologies, Alpha Energy, Alpha Industrial Power, Argus Technologies and G.B. Enterprises.

AC ON
DC ON
ALARM
48-3.6kW
Cordex™

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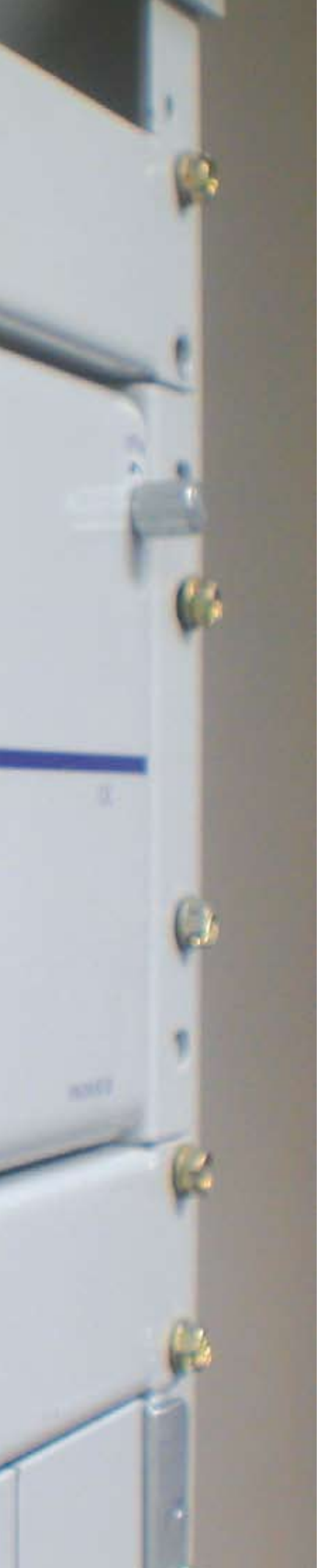
FL+IC
51.36V
0
No Alarms Present
1.91
2008/1/9 18:01:02
1-888-GO-ARGUS
Cordex
RS 232
STATUS
OK
MIN
MAJ
RST



Cordex Controllers

The Cordex CXC is Argus' latest generation of advanced digital controllers for DC power system monitoring and control. Cordex supervisory controllers come in a wide array of modular designs for compact integration into Argus DC systems. Stand-alone rack mount versions are also available for DC systems, legacy controller upgrades, and site monitoring solutions.

A graphic LCD display with state-of-the-art touch-screen interface allows simple and convenient set up, control, and monitoring of Cordex rectifiers. Innovative IP technology allows complete configuration and monitoring from any location via the Internet using a standard web browser.

Cordex CXC controllers come standard with several advanced battery management features to allow for significant savings of capital and operational expenses. Some additional features include user definable alarms with custom algorithms, digital and analog input monitoring, data logging, integrated SNMP, and highly reliable CAN bus communications. Optional RS-485 communication is also available to control the legacy "Pathfinder" series of rectifiers.

The Cordex CXC is designed for effortless operation of the Cordex rectifier family, making time consuming and complicated set up and monitoring of DC power systems a thing of the past.

Main

- **Web based GUI interface:** Web browser support for local or remote control and monitoring of power system standard
- **Single point setup and control**
- **Auto voltage adjustment and load sharing**
- **Analog digital inputs**
- **Configurable form C relay outputs**
- **Various preset alarms:** Ability to configure up to (20) customized alarms
- **User programmable logic statements**
- **Legacy power system upgrade:** Controls legacy Argus Pathfinder based systems and can be used as a site monitor for any Argus or 3rd party DC power system
- **CAN communications:** Common platform for Argus power electronics and peripherals, rugged and field proven protocol
- **Fail safe system operation:** In the event of CXC fail, rectifiers continue to run with default settings, fail alarm generated, and LVD's (if equipped) remain energized
- **Power save function:** Improves operational efficiency by running minimum number or rectifier modules required as per system load
- **System start delay:** Allows delay for other AC powered equipment to start before rectifiers
- **Ramp test control:** Disables fail alarm on no-load conditions
- **SNMP support:** Network management service support for managing multiple systems in a single network
- **Email notifications:** Via TCP/IP
- **Cordex peripheral support:** Optional add-on's for individual cell and temperature monitoring and for expanding controller I/O
- **Multi language support:** Including Chinese characters

Battery Management

- **Temperature compensated float voltage:** Increases voltage with temperatures below 25˚C (77˚F) and decreases charge voltage above 25˚C (77˚F), maximizes life and capacity of battery and prevents thermal runway
- **Battery equalize:** Manual, automatic, and periodic equalize charge modes, optional Battery Current Terminate function to prevent over charging of battery
- **Battery boost mode:** Offline high-voltage equalize charge with interlock safety feature
- **Dynamic charge current control:** Limits battery recharge current to a fixed value, helps to prevent thermal runway
- **Battery test:** Sets rectifier voltage low and performs safe discharge of batteries through the connected system loads
- **Battery capacity prediction:** Calculates current battery capacity after a discharge
- **Battery runtime prediction:** Based on current battery capacity and system load
- **Battery logging:** Retain up to (40) records of battery statistics and events

Maintenance

- **Data logger:** Record any system input(s), and set sample rate or record on deviation. Store up to (500) events via manual or auto start/stop
  - Typical data log applications: Detailed battery discharge info, AC voltage watch dog, outdoor cabinet thermal performance
- **Easy remote software upgrades:** Fail-safe protected upgrades for Argus controllers, rectifiers and peripherals

Cordex™ CXCI
System Controller

CXCI

- Control and monitor via Internet Explorer browser
- Internet ready, integrated SNMP
- High reliability CAN bus communication
- User definable alarms and data logging
- Flexible battery management features
- Smart peripheral monitoring features
- Integrated controller for 2RU rectifiers

Features

Part number: ..... Integrated option on 1.8kW, 650W, 400W, and 250W shelves

Display:..... 4 segment LCD for V/I display
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:..... RJ45 ethernet port (front)
RS232 modem port (front)

System I/O:
- Alarm relays:..... 4 (3+1 internal on some models)
- Voltage inputs:..... 1 + 1 internal
- Temperature inputs: 2
- Current inputs:..... 1 (0+1 internal on some models)
- Digital inputs:..... 2

Electrical

Input voltage:..... 17 to 65VDC
Current:..... <100mA @ 48VDC or < 200mA @ 24VDC

Mechanical

Dimensions:
- mm:..... 88H x 26W x 280D
- inch:..... 3.5H x 1W x 11D

Mounting:..... Integrated on Cordex 2RU series 19" & 23" shelves

Environmental

Temperature:..... -40 to 65°C (-40 to 149°F)
Humidity:..... 0 to 95% RH non-condensing

Standards

Safety:..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked

Cordex™ CXCR/CXCP
System Controller

CXCR Rack Mount Controller

- LCD touch-screen user interface
- Internet ready, integrated SNMP
- High reliability CAN bus communication
- User definable alarms and data logging
- Flexible battery management features
- Smart peripheral monitoring features
- 19/23" Universal rack or panel mount configurations

Features

Part number: 018-557-20

Display:.....LCD touchscreen display (160 x 160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:.....RJ45 ethernet port (front accessible rear port)
RS232 craft port (front)
RS232 modem port (optional)

Controller I/O:
- Voltage inputs:.....2
- Temperature inputs: 2
- Current inputs:.....4
- Bi voltage inputs:.....2
- Digital inputs:.....8
- Relay outputs:.....8

Mechanical

Mounting: .....CXCR with 19" or 23" rack mounting
CXCP panel mount

CXCP/R (excludes mounting brackets)
Dimensions:
- mm:.....131H x 431W x 100D
- inches:.....5.1H x 16.9W x 3.9D

Weight:.....6.2kg (13.8lb)

Environmental

Temperature:
- Extended:.....-40 to 65°C (-40 to 149°F)
- Humidity:.....0 to 95% RH non-condensing

Standards

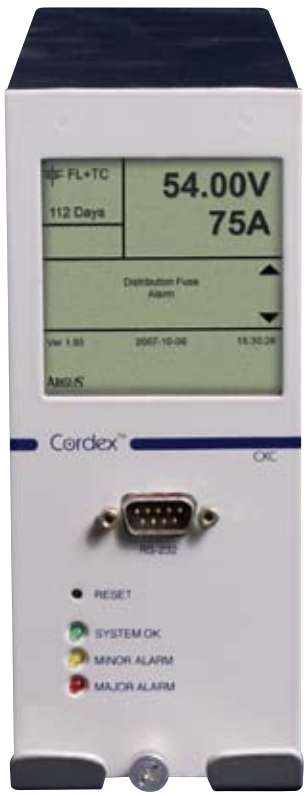
Safety:.....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: .....ETSI 300 386

Emissions:.....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)

Immunity:.....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6

Cordex™ CXCM
System Controller



CXCM

- LCD touch-screen user interface
- Internet ready, integrated SNMP
- High reliability CAN bus communication
- User definable alarms and data logging
- Flexible battery management features
- 4RU modular CXC for 1kW rectifier shelves

Features

Part number: 018-557-20

Display:.....LCD touchscreen display (160 x 160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:.....RJ45 ethernet port (front accessible rear port)
RS232 craft port (front)
RS232 modem port (optional)

Controller I/O:
- Voltage inputs:.....1 + 1 internal
- Temperature inputs: 2
- Current inputs:.....1
- Bi voltage inputs:.....1
- Digital inputs:.....3 (2+1 internal on some models)
- Relay outputs:.....8

Mechanical

Mounting: .....Modular controller for 1kW rectifier shelves

Dimensions:
- mm:.....177H x 74W x 255D
- inches: .....6.9H x 2.9W x 10D

Weight:.....1.8kg (3.9lb)

Environmental

Temperature:
- Extended:.....-40 to 65°C (-40 to 149°F)
- Humidity: .....0 to 95% RH non-condensing

Standards

Safety:.....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: .....ETSI 300 386

Emissions:.....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)

Immunity:.....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6

Cordex™ CXCM2
System Controller

CXCM2

- LCD touch-screen user interface
- Internet ready, integrated SNMP
- High reliability CAN bus communication
- User definable alarms and data logging
- Flexible battery management features
- Smart peripheral monitoring features
- 2RU modular CXC for 1.8kW rectifier shelves

Features

Part number: 018-573-20

Display:.....LCD touchscreen display (160x160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:.....RJ45 ethernet port (front)

Controller I/O:
Voltage inputs:.....1 + 1 internal
Temperature inputs: 2
Current inputs:.....2
Digital inputs:.....6
Relay outputs:.....6

Electrical

Input voltage: .....17 to 65VDC
Current: .....<100mA @ 48VDC or < 200mA @ 24VDC

Mechanical

Dimensions:
mm:.....96.4H x 128W x 247D
inches: .....3.4H x 5W x 9.7D
Mounting: .....Modular controller for 1.8kW shelves

Environmental

Temperature:.....-40 to 65°C (-40 to 149°F)
Humidity:.....0 to 95% RH non-condensing

Standards

Safety:.....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked

Cordex™ CXCR 125/220V
System Controller

CXCR 125/220V
Rack Mount Controller

- LCD touch-screen user interface
- Internet ready, integrated SNMP
- High reliability CAN bus communication
- User definable alarms and data logging
- Flexible battery management features
- Smart peripheral monitoring features
- 19/23" Universal rack mount configurations

Features

Part number: 018-570-20

Display:.....LCD touchscreen display (160 x 160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:.....RJ45 ethernet port (front accessible rear port)
RS232 craft port (front)
RS232 modem port (optional)

Controller I/O:
- Voltage inputs:.....1
- Temperature inputs: 2
- Current inputs:.....1 shunt +1 hall effect
- Bi voltage inputs:.....4
- Digital inputs:.....4
- Relay outputs:.....8

Mechanical

Mounting: .....19" or 23" rack mounting

CXCR 125/220V (excludes mounting brackets)
Dimensions:
- mm:.....131H x 431W x 100D
- inches:.....5.1H x 16.9W x 3.9D

Weight:.....6.2kg (13.8lb)

Environmental

Temperature:
- Extended:.....-40 to 65°C (-40 to 149°F)
- Humidity: .....0 to 95% RH non-condensing

Standards

Safety:.....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: .....ETSI 300 386

Emissions:.....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)

Immunity:.....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6

Cordex™ CXCM4
System Controller

CXCM4

- LCD touch-screen user interface
- Internet ready, integrated SNMP
- High reliability CAN bus communication
- User definable alarms and data logging
- Flexible battery management features
- Smart peripheral monitoring features
- 4RU modular CXC for 3.1/3.6kW rectifier shelves

Features

Part number: 018-574-20

Display:.....LCD touchscreen display (160 x 160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:.....RJ45 ethernet port
RS232 craft port (front)

Controller I/O:
Voltage inputs:.....1 + 1 internal
Temperature inputs: 2
Current inputs:.....4
Bi voltage inputs:.....2
Digital inputs:.....4
Relay outputs:.....8

Mechanical

Dimensions:
mm:.....177H x 87W x 257D
inches:.....7.0H x 3.4W x 10.1D
Weight:.....1.8kg (3.9lb)
Mounting: .....Modular controller for 3.1kW and 3.6kW shelves

Environmental

Temperature:
Extended:.....-40 to 65°C (-40 to 149°F)
Humidity: .....0 to 95% RH non-condensing

Standards

Safety:.....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: .....ETSI 300 386

Emissions:.....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)

Immunity:.....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6

BMS (Battery Monitor System)

CXC Smart Peripheral

- Individual cell battery and string voltage measurements
- Shunt multiplexing for multiple current measurements
- Temperature monitoring
- CAN bus peripheral add-on for CXC
- Advanced monitoring and logging via CXC controller
- Detailed monitoring of up to four battery strings

Electrical

BCMC

Input voltage: ..... List 2: 9.6 to 62VDC
List 4: 88 to 306VDC
*requires external supply
DCCT: ..... +15V +/-5%, 25mA
-15V +/-5%, 25mA

Ring Devices

Power: ..... 19.5 to 24V *supplied from BCMC
BCM input signal: ..... 0 to 16.5VDC
SM input signal: ..... -50mV / +50mV
HV input signal: ..... 0 to 320VDC (HV320)
0 to 600VDC (HV600)

Mechanical

BCMC

Dimensions:
mm: ..... 38H x 181.9D x 207.6W
inches: ..... 1.50H x 7.16D x 8.18W
Mounting: ..... 19/23" rack mount
(via 030-734-20 2-module peripheral chassis)

Ring Devices

Dimensions (excludes temperature sensor):
mm: ..... 22.7H x 43D x 104.6W
inches: ..... 0.89H x 1.69D x 4.12W
Mounting: ..... Battery or wall mount

Environmental

Temperature:
Standard: ..... -5 to +55°C (23 to 131°F)
Storage: ..... -40 to +70°C (-40 to 158°F)
Humidity: ..... 0 to 95% RH non-condensing

Communications

BCMC

Software: ..... Requires CXC V1.93 min
LED's: ..... Power on (green)
Module acquired (green)
4x Battery string OK (green)
4x Battery string alarm (yellow)

Detailed reporting information, configuration, and logging performed via CXC controller

Ring Devices

LED's: ..... Data transfer (green)
Communications lost (yellow)
Device on alarm (red)

Connections

BCMC

Power supply: ..... 2-POS screw terminal block for up to #18AWG wire
CAN IN/OUT: ..... 2x RJ-12 offset
Ring device:
IN/OUT: 8x RJ-11
DCCT: ..... 4x 4-POS molex connector

Ring Devices

BCM:
Communications: ..... RJ-11 (in/out)
Temperature: ..... Metal tab for ambient sense and ⅜" lug for battery terminal mount
Signal: ..... 2x #18AWG signal wires
(loose ⅜" and ¼" crimp lugs provided)

SM:
Communications: ..... RJ-11 (in/out)
Signal: ..... Screw terminal block for up to #18AWG wire

HV:
Communications: ..... RJ-11 (in/out)
Signal: ..... Screw terminal block for up to #18AWG wire
(loose ⅜" and ¼" lugs provided)

Cordex™ 4R/8D ADIO
CXC Smart Peripheral

4R/8D ADIO

- Provides I/O expansion to existing Cordex controllers
- Additional four relay alarm outputs
- Additional eight digital inputs
- Connects via standard CAN communication interface
- Programmable and adjustable via CXC interface

Electrical

Part number: 018-590-20

Power supply:
Voltage: .....9V to 60VAC
Current:.....500mA
Power:.....5W

Digital inputs:
Inactive voltage: .....-1.5 to 1.5V
Active voltage:.....± (5 to 60V)

Relay outputs:
Voltage: .....Up to 60V
Current:.....500mA

User Interface

Status indication:
LED's: .....Power on (green)
Module acquired (green)

Connections:
Power supply:.....Terminal block (#16 to 26AWG)
Digital input: .....Terminal block (#16 to 26AWG)
Relay output: .....Terminal block (#16 to 26AWG)
CAN In/Out:.....RJ12 offset connector

Environmental

Operating:
Temperature: .....-40 to 75°C (-40 to 167°F)
Humidity: .....0 to 95% non-condensing

Related Components

Rack mount shelf: 030-734-20
Wall mount shelf:.....030-764-20

Standards

Unit is designed to meet the following standards

CSA:.....CSA C22.2 No 60950-1-03
UL:.....60950-1 1st edition
CE:.....EN60950
NEBS:.....GR-1089-CORE
GR-63-CORE

4R/8D ADIO

	CXCM	CXCM2	CXCM4	CXCI	CXCR/CXCP	CXCR HV
Specifications:						
Screen	Full graphic LCD 160 x 160 pixels	Full graphic LCD 160 x 160 pixels	Full graphic LCD 160 x 160 pixels	Basic current / Volts display only	Full graphic LCD 160 x 160 pixels	Full graphic LCD 160 x 160 pixels
Inputs:						
Analog	2V, 2T,1C, 1BIV	1V, 2T, 2C, 4BIV	2V, 2T, 4C, 2BIV	1V, 1C, 2T	2V, 2T, 4C, 2BIV	1V, 2T, 1C, 4BIV, 1GFI
Digital	3	6	4	2	8	4
Alarm relay outputs	8 Form C	6 Form C	8 Form C	4 Form C	8 Form C	8 Form C
Dimensions (H x W x D):						
mm	177 x 74 x 255	86.4 x 128 x 247	177 x 87 x 257	88 x 26 x 280	131 x 431 x 100	131 x 431 x 100
inches	6.9 x 2.9 x 10	3.4 x 5 x 9.7	7 x 3.4 x 10.1	3.5 x 1 x 11	5.1 x 16.9 x 3.9	5.1 x 16.9 x 3.9
Rectifier shelf option availability:						
250W (12VDC)				Yes		
400W (24VDC)				Yes		
650W (48VDC)				Yes		
1kW (48VDC)	Yes				Yes	
1.8kW (48VDC)		Yes		Yes	Yes	
3.1kW (24VDC)			Yes		Yes	
3.6kW (48VDC)			Yes		Yes	
1.1kW (125/220VDC)						Yes
4.4kW (125/220VDC)						Yes

No Alarms Present
2008/1/9 16:01:02
1-888-GO-ARGUS
STATUS
OK
MIN
MAJ
RST
Cordex™
48-3.6kW
AC ON
DC ON
ALARM

Power Solutions

Argus has over 20 years experience providing a wide variety of fully integrated DC power system solutions. With options for standardized systems, and custom DC system integration, Argus has the flexibility to provide a DC power solution for a wide range of power requirements and various site installation requirements.

Integrated shelf systems are available for all small power rectifier models providing a complete power solution in a single rack mount package. The systems incorporate a Cordex controller, rectifiers, and DC distribution options in a single compact shelf design. Optional accessories such as LVD's, shunts, and temperature compensation are common options on most integrated solutions.

For medium to large system applications, Argus can provide both standard and custom DC system solutions designed to maximize space and cost savings. Systems can be integrated with a wide array of options including various relay rack solutions, custom DC distribution configurations, multiple voltage output designs, and front access solutions to name a few.

Coupling advanced Cordex power technology with an enormous selection of system components, Argus can easily provide optimal system solutions up to 8,000 Amps.

Cordex™ 250W
Modular Rectifier Shelf Systems

Cordex 1kW Shelf Power System

- Integrated 12VDC shelf power systems up to 1000W (1kW)
- Bulk 12VDC power systems up to 1250W (1.25kW)
- Distribution modules available with optional LVD and shunts
- Universal 19/23" rack mounting
- Designed for CSA, UL, CE, FCC and C-Tick standards

Cordex 12-250W Rectifier Shelves

Model	Rectifiers	Controller	Distribution	Part number
19/23" 2RU universal mount	4 x CXRC 12-250W	1 x CXCI	(4) AM bullet type breakers	030-770-20
19/23" 2RU universal mount	5 x CXRC 12-250W	1 x CXCI	Bulk power for external distribution panel	030-783-20

19/23" Shelf Systems

P/N 030-770-20
Cordex 1000W shelf power system with CXCI controller & bullet breaker distribution

P/N 030-783-20
Cordex 1250W bulk power system with CXCI controller

Shelves

Dimensions:
mm: ..... 89H x 435W x 302D
inches: ..... 3.5H x 17.1W x 11.9D
Weight: 6.9kg (15.5lb)

Note: Shelf P/Ns DO NOT include modules or distribution breakers
Weights DO NOT include modules
Dimensions do not include mounting bracket

Communication ports:
CAN: ..... Interface to control rectifiers. Smart peripherals
Ethernet: ..... 10/100 Base-T for TCIP/SNMP features

Environmental

Temperature:
Standard: ..... -40 to 50°C (-40 to 122°F)
Storage: ..... -40 to 85°C (-40 to 185°F)
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 3000m (-1640 to 9840ft)
Cooling: ..... Natural or forced convection, vertical airflow

Related Components

Cordex rectifier CXRC 12-250W: See page 40
Cordex controller CXCI: See page 7
AM plug-in breakers: See page 37

Cordex™ 400W
Modular Rectifier Shelf Systems

Cordex 1.6kW Shelf Power System

- Integrated 24VDC shelf power systems up to 1.6kW
- Bulk 24VDC power systems up to 2kW
- Distribution modules available with optional LVD and shunts
- Universal 19" and 23" rack mounting
- Designed for CSA, UL, CE, FCC and C-Tick standards

Cordex 24-400W Rectifier Shelves

Model	Rectifiers	Controller	Distribution	Part number
19/23" 2RU universal mount	4 x CXRC 24-400W	1 x CXCI	(4) AM bullet type breakers	030-763-20
19/23" 2RU universal mount	5 x CXRC 24-400W	1 x CXCI	Bulk power for external distribution panel	030-773-20

19/23" Shelf Systems

P/N 030-763-20
Cordex 1.6kW shelf power system with CXCI controller & bullet breaker distribution

P/N 030-773-20
Cordex 2kW bulk power system with CXCI controller

Shelves

Dimensions:
mm:.....89H x 435W x 302D
inches:.....3.5H x 17.1W x 11.9D
Weight:.....6.9kg (15.5lb)

Note: Shelf P/Ns DO NOT include modules or distribution breakers
Weights DO NOT include modules
Dimensions do not include mounting bracket

Communication ports:
CAN:.....Interface to control rectifiers. Smart peripherals
Ethernet:.....10/100 Base-T for TCIP/SNMP features

Environmental

Temperature:
Standard:.....-40 to 50°C (-40 to 122°F)
Storage:.....-40 to 85°C (-40 to 185°F)
Humidity:.....0 to 95% RH non-condensing
Elevation:.....-500 to 3000m (-1640 to 9840ft)
Cooling:.....Natural or forced convection, vertical airflow

Related Components

Cordex rectifier CXRC 24-400W: See page 41
Cordex controller CXCI: See page 7
AM plug-in breakers: See page 37

Cordex 2.6kW Shelf Power System

- Integrated 48VDC shelf power systems up to 2.6kW
- Bulk 48VDC power systems up to 3.2kW
- Distribution modules available with optional LVD and shunts
- Rear access 19/23" and front access 19" and 23" solutions
- Designed for CSA, UL, CE, FCC and C-Tick standards

Cordex 48-650W Rectifier Shelves

Model	Rectifiers	Controller	Distribution	Part number
19/23" 2RU universal mount	4 x CXRC 48-650W	1 x CXCI	(4) AM bullet type breakers	030-728-20
19/23" 2RU universal mount	5 x CXRC 48-650W	1 x CXCI	Bulk power for external distribution	030-782-20
23" 2RU front access	4 x CXRC 48-650W	1 x CXCI	(4) AM bullet (10) GMT fuse	030-722-20
19" 2RU front access	3 x CXRC 48-650W	1 x CXCI	(4) AM plug-in (10) GMT fuse	030-727-20

19/23" Shelf Systems

P/N 030-728-20
Cordex 2.6kW shelf power system with CXCI controller & bullet breaker distribution

P/N 030-782-20
Cordex 3.2kW bulk power system with CXCI controller Optional LVD shunt with battery breaker

P/N 030-722-20
Cordex 2.6kW front access shelf power system with CXCI controller and breaker/fuse distribution

P/N 030-727-20
Cordex 1.9kW front access shelf power system with CXCI controller and breaker/fuse distribution

Shelves

19" Shelves

Dimensions:
mm: ..... 89H x 435W x 302D
inches: ..... 3.5H x 17.1W x 11.9D
Weight: 6.9kg (15.5lb)

23" Front Access Shelf

Dimensions:
mm: ..... 89H x 544W x 307D
inches: ..... 3.5H x 21.42W x 12.0D
(excludes optional fan tray and baffle)
Weight: ..... 16.8kg (37lb) (fully equipped with four rectifiers)

Note: Shelf P/Ns DO NOT include modules or distribution breakers
Weights DO NOT include modules
Dimensions do not include mounting bracket

Communication ports:
CAN: ..... Interface to control rectifiers. Smart peripherals
Ethernet: ..... 10/100 Base-T for TCIP/SNMP features

Environmental

Temperature:
Standard: ..... -40 to 50°C (-40 to 122°F)
Storage: ..... -40 to 85°C (-40 to 185°F)
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 3000m (-1640 to 9840ft)
Cooling: ..... Natural or forced convection, vertical airflow

Related Components

Cordex rectifier CXRC 48-650W: See page 42
Cordex controller CXCI: See page 7
AM plug-in breakers: See page 37
GMT style fuses: See page 37

Cordex™ 1kW
Modular Rectifier Shelf Systems

Cordex 4kW Shelf Power System

- Integrated 48VDC shelf power systems up to 4kW
- Bulk 48VDC power systems up to 6kW
- Distribution modules available for plug-in breakers and GMT fuses
- 19" and 23" rack mounting solutions
- Designed for CSA, UL, CE and C-Tick standards

Cordex 48-1kW Rectifier Shelves

Model	Rectifiers	Controller	Distribution	Part number
19" flush mount	5 x CXRC 48-1kW	CXCM	Bulk power for external distribution panel	030-707-20 L0
19" flush mount	6 x CXRC 48-1kW	Requires CXCR rack mount controller	Bulk power for external distribution panel	030-707-20 L81
23" center mount	4 x CXRC 48-1kW	1 x CXCM	Integrated plug-in breakers & GMT fuse option	030-704-20 L0

19/23" Shelf Systems

P/N 030-707-20 L0
(flush mount) Cordex 5kW bulk power system with plug in controller

P/N 030-707-20 L81
(flush mount) Cordex 6kW bulk power system

23" Shelf Systems

P/N 030-704-20 L0
(center mount) Cordex 4kW shelf power system with plug in controller & bullet type breaker distribution

Shelves

19" & 19/23"
Dimensions:
mm:.....177H x 444W x 302D
inches:.....6.9H x 17.5W x 11.9D
Weight:.....7.5kg (16.5lb)

23"
Dimensions:
mm:.....177H x 543W x 302D
inches:.....6.9H x 21.4W x 11.9D
Weight:.....10.2kg (22.5lb)

Note: Shelf P/Ns DO NOT include rectifier modules or distribution breakers
Weights DO NOT include modules
Dimensions do not include mounting brackets

Communication ports:
CAN:.....Interface to control rectifiers
Ethernet:.....10/100 Base-T for TCIP/SNMP features

Related Components

Cordex rectifier CXRC 48-1kW: See page 43
Cordex controller CXCM: See page 9
AM plug-in breakers: See page 37
GMT style fuses: See page 37

CXPS 24-2T
Standard 24VDC System

CXPS 24-2T
23" Rail Mount Power System

- 24VDC systems using high density 3.1kW rectifiers
- Front access DC connections
- CXCM4 advanced modular controller
- Flexible integrated rack options
- Optional DC-DC converter upgrade kit
- Integrated system shunt and LVD

Features

Part number: 053-390-20

Configurations:
- 053-390-20-000 .....Base system with 23" mounting
- 053-390-20-010.....System mounted in 22RU (½ height) battery mount rack
- 053-390-20-020 .....System mounted in 44RU Zone 4 seismic rack
- 053-390-20-030 .....System mounted in 44RU Z4 rack with 3x battery trays for 6x 24V strings

Rectifier:.....Up to 11x 24V-3.1kW rectifier positions
Distribution:.....38x AM plug-in breaker positions
10x GMT type fuse positions
Shunt
Low voltage disconnect
Controller:.....CXCM4 modular controller

Electrical

Input:
- Voltage: .....176 to 312VAC
- Current:.....14.6A @ 240VAC nominal (per rectifier module)
- Frequency: .....45 to 66Hz
- Power factor: .....>.99

Output:
- Voltage: .....21 to 29VDC
- Current:.....System: 1200A max (distribution limited)
  Rectifier: 115A @ 27VDC
- Power:.....System: 28.8kW max
  Rectifier: 3100W max

Environmental

Temperature:.....-40 to +65°C (-40 to 149°F)
-40 to +75°C (-40 to 167°F) de-rated output
Humidity:.....0 to 95% RH non-condensing
Elevation: .....-500 to +2800m (-1640 to 9186ft)
-500 to +4000m (-1640 to 13124ft) with de-rated output

Mechanical

Dimensions:
- mm:.....755H x 584W x 477D
- inches:.....29.7H x 23W x 18.8D
  (-000 configuration - excludes mounting brackets)

Weight:.....70.3kg (155lbs)
Mounting:.....23" center mount

Connnections:
- Load breaker:.....Hot: ¼"-20 studs on ⅝" centers
  Return: ¼" holes on ⅝" centers
- GMT fuses:.....Screw Terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Battery terminations: .....⅜" holes on 1" centers
  4x sets per polarity
- Rectifier input: .....⅜" holes on 1" centers
- Alarm connections: .....Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Access:.....Cable: top or bottom
  User: front access after installation

Related Components

038-257-20.....Cordex converter CXDF 24-48/2kW upgrade kit: See page 59

Cordex rectifier 24-3.1kW: See page 45
Cordex controller CXCM4: See page 12
AM plug-in breakers: See page 37
GMT style fuses: See page 37

CXPS 24-4T
Standard 24VDC System

CXPS 24-4T Power System

- 24VDC systems using high density 3.1kW rectifiers
- Front access DC connections
- CXCM4 advanced modular controller
- Includes 7ft seismic rack
- Optional DC-DC converter upgrade kits
- Integrated system shunt and LVD

Features

Part number: 053-391-20

Configurations:
- 053-391-20-020:.....System mounted in 44RU zone 4 seismic rack

Rectifier:.....Up to 11x 24V-3.1kW rectifier positions

Distribution:.....58x AM plug-in breaker positions (expandable to 78x positions)
10x GMT type fuse positions
Shunt
Low voltage disconnect

Controller:.....CXCM4 modular controller

Electrical

Input:
- Voltage: .....176 to 312VAC
- Current:.....14.6A @ 240VAC nominal (per rectifier module)
- Frequency: .....45 to 66Hz
- Power factor: .....>.99

Output:
- Voltage: .....21 to 29VDC
- Current:.....System: 1430A (expandable to 2000A with additional CXRF shelf)
  Rectifier: 115A @ 27VDC
- Power:.....System: 34.1kW (expandable to 48.0kw)
  Rectifier: 3100W max

Environmental

Temperature:.....-40 to +65°C (-40 to 149°F)
-40 to +75°C (-40 to 167°F) de-rated output

Humidity:.....0 to 95% RH non-condensing

Elevation: .....-500 to +2800m (-1640 to 9186ft)
-500 to +4000m (-1640 to 13124ft) with de-rated output

Mechanical

Dimensions:
- mm:.....2134H x 648W x 533D
- inches:.....84H x 25.5W x 21D (includes rack)

Weight:.....172kg (379lbs)

Mounting:.....23" center mount

Connnections:
- Load breaker:.....Hot: ¼"-20 studs on ⅝" centers
  Return: ¼" holes on ⅝" centers
- GMT fuses:.....Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Battery terminations: .....⅜" holes on 1" centers
  5x Sets per polarity
- Rectifier input: .....⅜" holes on 1" centers
- Alarm connections: .....Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Access:.....Cable: top or bottom
  User: front access after installation

Related Components

058-736-20 .....Cordex rectifier CXRF 24-3.1kW expansion shelf kit

038-257-20.....Cordex converter CXDF 24-48/2kW upgrade kit: See page 59

Cordex rectifier 24-3.1kW: See page 45
Cordex controller CXCM4: See page 12
AM plug-in breakers: See page 37
GMT style fuses: See page 37

CXPS 48-1T
Standard 48VDC System

CXPS 48-1T
23" Rail Mount Power System

- 48VDC systems using high density 3.6kW rectifiers
- Front access DC connections
- CXCM4 advanced modular controller
- Flexible integrated rack options
- Integrated system shunt and LVD

Features

Part number: 053-392-20

Configurations:
- 053-392-20-000: .....Base system with 23" mounting
- 053-392-20-010: .....System mounted in 22RU (½ height) battery mount rack
- 053-392-20-020: .....System mounted in 44RU zone 4 seismic rack
- 053-392-20-030: .....System mounted in 44RU Z4 rack with 3x battery trays for 3x 48V strings

Rectifier: .....Up to 5x 48V-3.6kW rectifier positions
Distribution: .....18x AM plug-in breaker positions
10x GMT type fuse positions
Shunt
Low voltage disconnect
Controller: .....CXCM4 modular controller

Electrical

Input:
- Voltage: .....176 to 320VAC
- Current: .....16.8A @ 240VAC nominal (per rectifier module)
- Frequency: .....45 to 66Hz
- Power factor: .....>.99

Output:
- Voltage: .....42 to 60VDC
- Current: .....System: 375A (expandable to 600A with additional CXRF shelf)
  Rectifier: 75A @ 48VDC
- Power: .....System: 18.0kW (expandable to 28.8kW with additional CXRF shelf)
  Rectifier: 3600W max

Environmental

Temperature: .....-40 to +65°C (-40 to 149°F)
-40 to +75°C (-40 to 167°F) de-rated output
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to +2800m (-1640 to 9186ft)
-500 to +4000m (-1640 to 13124ft) with de-rated output

Mechanical

Dimensions:
- mm: .....488H x 584W x 477D
- inches: .....19.25H x 23W x 18.8D
  (-000 configuration - excludes mounting brackets)

Weight: 49.8kg (110lbs)
Mounting: .....23" center mount

Connnections:
- Load breaker: .....Hot: ¼"-20 studs on ⅝" centers
  Return: ¼" holes on ⅝" centers
- GMT fuses: .....Screw Terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Battery terminations: .....⅜" holes on 1" centers
  4x sets per polarity
- Rectifier Input: .....⅜" holes on 1" centers
- Alarm connections: .....Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Access: .....Cable: top or bottom
  User: front access after installation

Related Components

058-716-70 .....Cordex rectifier CXRF 24-3.1kW expansion shelf kit

Cordex rectifier 48-3.6kW: See page 45
Cordex controller CXCM4: See page 12
AM plug-in breakers: See page 37
GMT style fuses: See page 37

CXPS 48-2T
Standard 48VDC System

CXPS 48-2T
23" Rail Mount Power System

- 48VDC systems using high density 3.6kW rectifiers
- Front access DC connections
- CXCM4 advanced modular controller
- Flexible integrated rack options
- Integrated system shunt and LVD

Features

Part number: 053-393-20

Configurations:
- 053-393-20-000 .....Base system with 23" mounting
- 053-393-20-010.....System mounted in 22RU (½ height) battery mount rack
- 053-393-20-020 .....System mounted in 44RU zone 4 seismic rack
- 053-393-20-030 .....System mounted in 44RU Z4 rack with 3x battery trays for 3x 48V strings

Rectifier:.....Up to 11x 48V-3.6kW rectifier positions
Distribution:.....38x AM plug-in breaker positions
10x GMT type fuse positions
Shunt
Low voltage disconnect
Controller:.....CXCM4 modular controller

Electrical

Input:
- Voltage: .....176 to 320VAC
- Current:.....16.8A @ 240VAC nominal (per rectifier module)
- Frequency: .....45 to 66Hz
- Power factor: .....>.99

Output:
- Voltage: .....42 to 60VDC
- Current:.....System: 825A (expandable to 1200A with additional CXRF shelf)
  Rectifier: 75A @ 48VDC
- Power:.....System: 39.6kW (expandable to 57.6kW with additional CXRF shelf)
  Rectifier: 3600W max

Environmental

Temperature:.....-40 to +65°C (-40 to 149°F)
-40 to +75°C (-40 to 167°F) de-rated output
Humidity:.....0 to 95% RH non-condensing
Elevation: .....-500 to +2800m (-1640 to 9186ft)
-500 to +4000m (-1640 to 13124ft) with de-rated output

Mechanical

Dimensions:
- mm:.....755H x 584W x 477D
- inches:.....29.7H x 23W x 18.8D
  (-000 configuration - excludes mounting brackets)

Weight:.....70.3kg (155lbs)
Mounting:.....23" center mount

Connnections:
- Load breaker:.....Hot: ¼"-20 studs on ⅝" centers
  Return: ¼" holes on ⅝" centers
- GMT fuses:.....Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Battery terminations: .....⅜" holes on 1" centers
  4x sets per polarity
- Rectifier input: .....⅜" holes on 1" centers
- Alarm connections: .....Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Access:.....Cable: Top or bottom
  User: front access after installation

Related Components

058-716-70.....Cordex rectifier CXRF 24-3.1kW expansion shelf kit

Cordex rectifier 48-3.6kW: See page 45
Cordex controller CXCM4: See page 12
AM plug-in breakers: See page 37
GMT style fuses: See page 37

CXPS 48-1.8-i
Standard 48VDC Power System

- 48VDC systems using high density 1.8kW rectifiers
- Front access DC connections
- Integrated CXCI advanced digital controller
- Wide range AC input
- Optional integrated systems with battery trays
- Integrated system shunt and LVD

CXPS 48-1.8-i Power System

Features

Part number: 053-990-20

Configurations:
- 053-990-20-000: .....Base system with 19/23" universal mounting
- 053-990-20-040: .....System mounted in 23", 44RU Z4 rack with 2x battery trays for 2x 48V strings
- 053-990-20-031:.....System mounted in 19", 44RU Z4 rack with 3x battery trays for 3x 48V strings

Rectifier:.....Up to 4x 48V-1.8kW rectifier positions
Distribution:.....14x load breaker positions (mid-trip, plug-in style)
4x battery breaker positions (series-trip, plug-in style)
Low voltage disconnect
Shunt
Controller:.....CXCI integrated controller

Electrical

Input:
- Voltage: .....176 to 312VAC (nominal)
  90 to 176VAC (de-rated O/P power)
- Current:.....14.6A @ 240VAC (per module)
  12.2A @ 120VAC (per module)
- Frequency: .....45 to 66Hz
- Efficiency:.....>91% (50-100% load @ nominal voltage)
- Power factor: .....>.99

Output:
- Current:
  - System: .....150A max @ nominal I/P
    96A max @ 120VAC I/P
  - Rectifier:.....37.5A @ 48VDC (nominal I/P)
    24A @ 48VDC (115 to 135VAC)
    (de-rated linearly to 18.75A @ 90VAC)
- Power:
  - System: .....7200W max @ nominal I/P
    4600W @ 120VAC I/P
  - Rectifier:.....1800W max @ nominal I/P
    1150W (115 to 135VAC)
    (de-rated linearly to 900W @ 90VAC)

Mechanical

Dimensions:
- mm:.....222H x 438W x 310D
- inches: .....8.75H x 17.24W x 12.2D
  (-000 configuration - excludes mounting brackets, rear cover, and module handle)

Weight:
- System:.....19kg (42lb)
- Rectifier: .....2.8kg (6.2lb) each

Mounting: .....19/23" universal mount (center or flush)

Connnections:
- Load breaker: .....14x sets, ¼"-20 studs on ⅝" centers
- Battery breaker:.....4x sets, ¼"-20 studs on ⅝" centers
- Return bar:.....18x sets, ¼" holes on ⅝" centers
- Rectifier input: .....HOT: 2x sets, ⅜" holes on 1" centers
  RTN: 2x sets, ⅜" holes on 1" centers
- Alarm: .....Screw terminal 1.31mm² to 0.128mm²
  (#16 to #26 AWG)
- CXCI input: .....25-pin D-Sub cable
- Access:.....Front access after installation

Environmental

Temperature:.....-40 to +65°C (-40 to +149°F)
-40 to +75°C (-40 to +167°F) de-rated output
Humidity:.....0 to 95% RH non-condensing
Elevation: .....-500 to +2800m (-1640 to 9186ft)
-500 to +4000m (-1640 to 13124ft)
with de-rated output

Related Components

058-156-20.....23" battery tray expansion kit
(for use with -040 configuration)
058-157-20.....19" battery tray expansion kit
(for use with -031 configuration)
470-347-10 .....100A battery breaker
747-503-20.....150A battery breaker
747-504-20.....250A battery breaker

Cordex rectifier 48-1.8kW: See page 44
Cordex controller CXCI: See page 7
AM plug-in breakers (load): See page 37

CXPS 48-1.8-M2
Standard 48VDC Power System

- 48VDC systems using high density 1.8kW rectifiers
- Front access DC connections
- Integrated CXCM2 modular digital controller
- Wide range AC input
- Optional integrated systems with battery trays
- Integrated system shunt and LVD

CXPS 48-1.8-M2 Power System

Features

Part number: 053-991-20

Configurations:
- 053-991-20-000:.....Base system with 19/23" universal mounting
- 053-991-20-040:.....System mounted in 23", 44RU Z4 rack with 2x battery trays for 2x 48V strings
- 053-991-20-031: .....System mounted in 19", 44RU Z4 rack with 3x battery trays for 3x 48V strings

Rectifier:.....Up to 7x 48V-1.8kW rectifier positions
Distribution:.....14x load breaker positions (mid-trip, plug-in style)
4x battery breaker positions
(series-trip, plug-in style)
Low voltage disconnect
Shunt
Controller:.....CXCM2 modular controller

Electrical

Input:
- Voltage: .....176 to 312VAC (nominal)
  90 to 176VAC (de-rated O/P power)
- Current:.....14.6A @ 240VAC (per module)
  12.2A @ 120VAC (per module)
- Frequency: .....45 to 66Hz
- Efficiency:.....>91% (50-100% load @ nominal voltage)
- Power factor: .....>.99

Output:
- Current:
  - System: .....262.5A max @ nominal I/P
    168A max @ 120VAC I/P
  - Rectifier:.....37.5A @ 48VDC (nominal I/P)
    24A @ 48VDC (115 to 135VAC)
    (de-rated linearly to 18.75A @ 90VAC)
- Power:
  - System: .....12600W max @ nominal I/P
    8050W @ 120VAC I/P
  - Rectifier:.....1800W max @ nominal I/P
    1150W (115 to 135VAC)
    (de-rated linearly to 900W @ 90VAC)

Mechanical

Dimensions:
- mm:.....222H x 438W x 310D
- inches:.....8.75H x 17.24W x 12.2D
  (-000 configuration - excludes mounting brackets, rear cover, and module handle)

Weight:
- System:.....28kg (62lb)
- Rectifier: .....2.8kg (6.2lb) each

Mounting: .....19/23" universal mount (center or flush)

Connnections:
- Load breaker: .....14x sets, ¼"-20 studs on ⅝" centers
- Battery breaker:.....4x sets, ¼"-20 studs on ⅝" centers
- Return bar:.....18x sets, ¼" holes on ⅝" centers
- Rectifier input: .....HOT: 2x sets, ⅜" holes on 1" centers
  RTN: 2x sets, ⅜" holes on 1" centers
- Alarm: .....Screw terminal 1.31mm² to 0.128mm²
  (#16 to #26 AWG)
- CXCM2 input: .....3x DB-style cable connections
- Access:.....Front access after installation

Environmental

Temperature:.....-40 to +65°C (-40 to +149°F)
-40 to +75°C (-40 to +167°F) de-rated output
Humidity:.....0 to 95% RH non-condensing
Elevation: .....-500 to +2800m (-1640 to 9186ft)
-500 to +4000m (-1640 to 13124ft)
with de-rated output

Related Components

058-156-20.....23" battery tray expansion kit
(for use with -040 configuration)
058-157-20 .....19" battery tray expansion kit
(for use with -031 configuration)
470-347-10 .....100A battery breaker
747-503-20 .....150A battery breaker
747-504-20 .....250A battery breaker

Cordex rectifier 48-1.8kW: See page 44
Cordex controller CXCM2: See page 10
AM plug-in breakers (load): See page 37

Cordex™ 432kW
Large Power System

Typical 48-108kW System

- 8,000A capacity
- Designed for MSCs, COs, and Cable Headend facilities
- Cordex 3.6kW modular rectifiers
- Circuit breaker and TPL fuse options
- Compact footprint
- Internal bay-to-bay copper busswork
- Expandable power and distribution bays

Electrical

AC input:.....Single phase, 208 to 277VAC
Dual 3 phase, 208 to 240VAC (w/o neutral)
Dual 3 phase, 360 to 480VAC (with neutral)
Rectifier voltage:.....208 to 277VAC
Max. bus capacity:.....10,000A system
2,000A per bay

Distribution

Fuses:
TPL:.....2 position, 61 to 800A breakers
GJ/GJ1P:.....1 pole up to 225A, 2 pole 250 to 400A, 3 pole 450 to 700A
Output termination:
TPL fuse:.....2 hole ½" dia. on 1¾" centers or 2 hole ⅜" dia. on 1" centers
GJ breaker:.....1 pole and 2 pole are ⅜" to 16, 3 pole are 2 hole, ½" dia. on 1¾" centers or ⅜" dia. on 1" centers
Ground bar:.....Overhead buss ground, 15 sets of 2 hole ½" dia. on 1¾" centers (basic system)

Mechanical

Part number:.....025-999-20

Enclosure:.....1.095mm (14 gauge) steel
Mounting:.....Standard 23" relay rack (flush rack mount) in box bay
Dimensions:
cm:.....213H x 71W x 71D
inches:.....84H x 28W x 28D
Weight:.....Approx. 272kg (600lb) per bay (no rectifiers)

Environmental

Temperature:.....0 to 50°C (32 to 122°F)
Humidity:.....0 to 95% RH non-condensing
Elevation:.....-500 to 2800m (-1640 to 9186ft)

Features

System level alarms/controls: Alarms/control parameters are user-programmable through built-in digital supervisory unit.

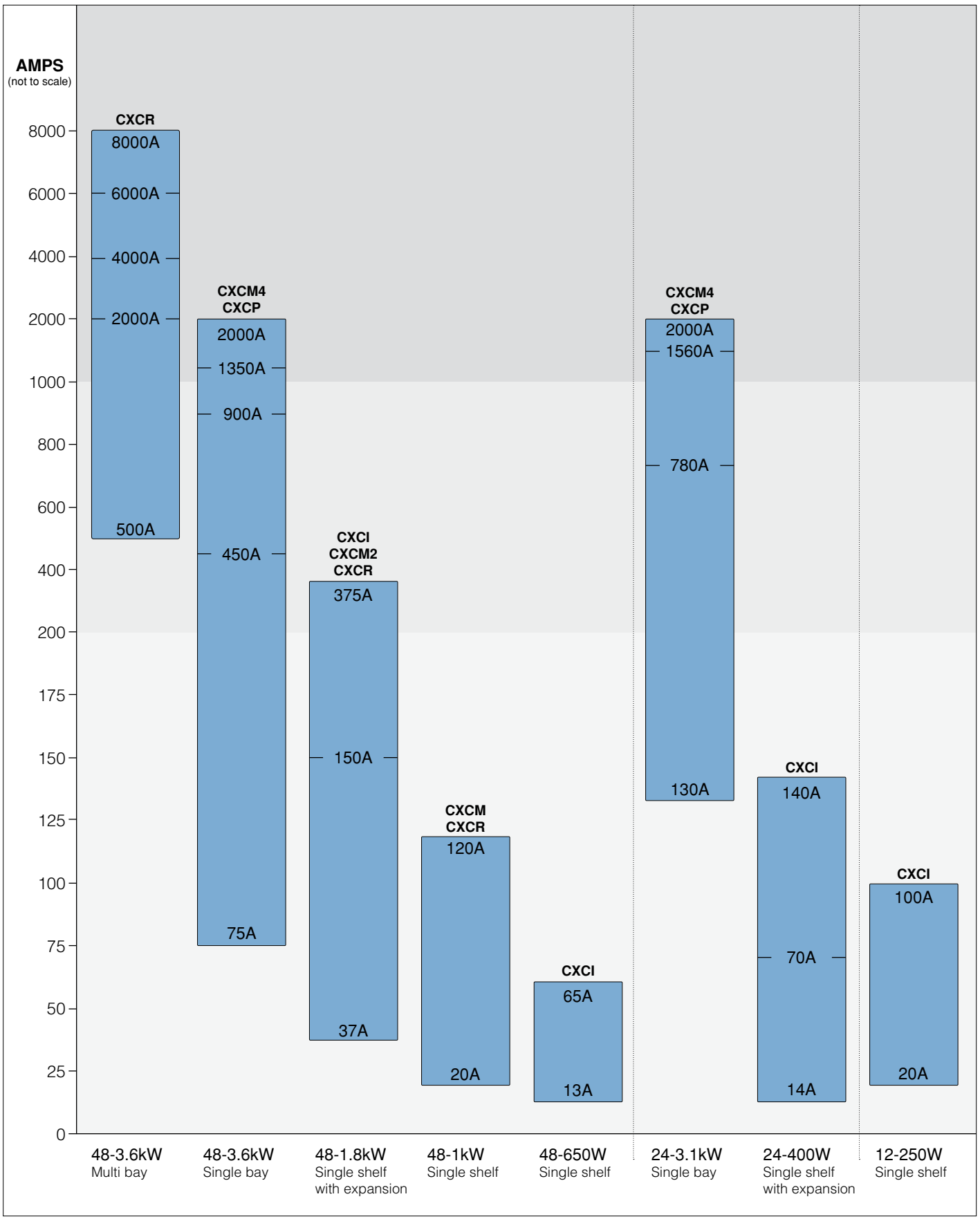
Indicators:.....LCD with touch screen
System OK (green LED)
System minor alarm (yellow LED)
System major alarm (red LED)

Alarm connections:.....0.34 to 2.5mm² (14 to 22AWG)

Load disconnect:.....48VDC/1200A x N mounted on load side (optional)

Related Components

Cordex rectifier CXRF 48-3.6kW: See page 45
Cordex controller CXCR: See page 8
GJ breakers: See page 37
TPL fuses: See page 37


AMPS
(not to scale)
8000
6000
4000
2000
1000
800
600
400
200
175
150
125
100
75
50
25
0
CXCR
8000A
6000A
4000A
2000A
500A
CXCM4
CXCP
2000A
1350A
900A
450A
75A
CXCI
CXCM2
CXCR
375A
150A
37A
CXCM
CXCR
120A
20A
CXCI
65A
13A
CXCM4
CXCP
2000A
1560A
780A
130A
CXCI
140A
70A
14A
CXCI
100A
20A
48-3.6kW
Multi bay
48-3.6kW
Single bay
48-1.8kW
Single shelf
with expansion
48-1kW
Single shelf
48-650W
Single shelf
24-3.1kW
Single bay
24-400W
Single shelf
with expansion
12-250W
Single shelf

ARGUS®
TECHNOLOGIES
FUSE

Distribution

Argus offers a wide variety of DC breaker and fuse panels for distributing power to critical loads. Panels are available in various sizes, output voltages and use industry standard breakers and fuses.

Multiple loose panel options are available for either expanding existing site distribution requirements, or for developing custom DC power systems to specific customer requirements. Panels are available with several options including front access, ground bars, integrated shunts, LVD's, and several other features.

Argus also offers a variety of Universal Distribution Centers that accommodate system control, distribution, battery connections, and other system elements in a single rack mount package. Combining with a Cordex rectifier system allows for a completely integrated solution in a very compact solution.

Argus distribution panels have the flexibility to be configured as a solution to practically any DC power distribution requirement.

Breaker Panels
Stand-Alone DC Distribution

Breaker Panels

- AM bolt-in, AM plug-in and GJ breaker options
- 19" and 23" rack mount models
- 12, 24 or 48V configurations
- Rear access and front access options
- Designed for flexible and custom DC distribution

Breaker Panel Options

Part number	Breakers	Positions	Capacity	Mounting	RU
020-107-20	AM bolt-in	16/22	550A	19/23"	3
020-588-20	AM plug-in	16	400A	19"	5
020-589-20	AM plug-in	20	400A	23"	5
020-671-20	AM plug-in	24	600A	23"	3
020-675-20	AM plug-in	18	600A	19"	3
020-534-20	GJ	3		19/23"	3
020-578-20	GJ	4		23"	4

Fuse Panels
Stand-Alone DC Distribution

Fuse Panels

- GMT and TPL fuse panel options
- TPS fuse options using fuse mount breaker cartridges
- 19" and 23" rack mount models
- 12, 24 or 48V configurations
- Designed for flexible and custom DC distribution

Fuse Panel Options

Part number	Breakers	Positions	Capacity	Mounting	RU
020-103-20	GMT	32	60A	19/23"	1
020-005-20	GMT	20	90A	19/23"	1
020-597-20	TPL	2	1200A	23"	5
020-588-20	TPS*	16	400A	19"	5
020-589-20	TPS*	20	400A	23"	5
020-671-20	TPS*	24	600A	23"	3
020-675-20	TPS*	18	600A	19"	3
*Requires AM plug-in breaker cartridge for TPS fuse mount (520-059-10)					

Vista Distribution Centers
Universal Distribution Centers

Vista Two Tier UDC

- Various modular distribution configurations
- Complete front access
- Integrated Cordex system controller
- Integrated shunt and LVD options
- AM plug-in breaker, GJ breaker and GMT fuse options

Vista UDC Options

Model	Part number	Breakers	Positions	Capacity	Mounting	RU
Single tier	020-645-20	AM plug-in	20-24	600A	23"	7
Two tier	020-646-20	AM plug-in	40-48	1200A	23"	9
Four tier	020-635-20	AM plug-in	80-96	2000A	23"	17

Modular Distribution Tier Options

Single voltage	24 position AM plug-in 20 position AM plug-in w/ 600A LVD 3 position GJ 3 position GJ w/ 600A LVD
Dual voltage	12x primary & 10x secondary (AM plug-in) 16x primary & 6x secondary (AM plug-in) 8x primary (w/ LVD) & 10x secondary (AM plug-in) 12x primary (w/ LVD) & 6x secondary (AM plug-in)

Note: Consult factory for NEBS L3 certified system solutions using Vista UDC's

Related Components

Cordex controller CXCP: See page 8
AM plug-in breakers: See page 37
GMT style fuses: See page 37

DCP03
Universal Distribution Center

DCP03 300A Distribution Center

- Up to 18 breaker positions
- Optional battery breaker disconnects
- Shunt and LVD options
- Universal 19/23" rack mount
- Compact 3RU high design
- Integrated controller I/O for 1.8kW rectifiers

Electrical

Part number: 020-702-20

Voltage: .....24VDC or 48VDC (list option configurable)
Current: .....300A DC max

Mechanical

Dimensions (excludes mounting brackets):
- mm: .....133H x 432W x 318D
- in: .....5.23H x 17.25W x 12.5D

Mounting: .....19/23", flush/center mount
Weight: 11.6kg (25.6lb)

Connnections:
- Load breaker: .....¼"-20 studs on ⅝" centers
  *18x sets w/ L87, 14x sets w/ L88
- Battery breaker: .....¼"-20 studs on ⅝" centers
  *4x sets w/ L88 only
- Ground bar: .....18x sets ¼" holes on ⅝" centers

Rectifier input:
- Hot: .....2x sets ⅜" holes on 1" centers
- Return: .....2x sets ⅜" holes on 1" centers
- Alarm: .....1.31 to 0.128mm^2 (#16 to #26AWG)
- Communications: .....Terminal blocks: Internal I/O
  DB (serial) connection(s): CXCI and CXCM2 I/O
  RJ-12 Offset: CAN for optional ADIO
- Access: .....Front access after installation with 1RU required above panel for tooling

Environmental

Temperature: .....-40 to +65°C (-40 to 149°F)
-40 to +55°C (-40 to 131°F) de-rated when L71 (24V LVD) equipped
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to +4000m (-1640 to 13124ft)

Related Components

Distribution:
- L87: .....18x load positions (AM plug-in breaker)
- L88: .....14x load positions & 4x battery positions (AM plug-in breaker)

System options:
- L71: .....24V LVD
- L72: .....48V LVD
- L84: .....400A shunt
- L74: .....CXCI I/O extension
- L75: .....CXCM2 I/O extension
- L79: .....4R/8D ADIO
- L93: .....Top cover

External options:
- 614-840-13: .....Bus bar for UDC & single 19/23" 1.8kW shelf (qty 2x req'd)
- 614-841-13: .....Bus bar for UDC & two 19" 1.8kW shelves (qty 2x req'd)
- 037-202-20: .....Kydex cover kit; for UDC & single 19/23" 1.8kW shelf
- 037-207-20: .....Kydex cover kit; for UDC & two 19" 1.8kW shelves

DCP03 rear view

Distribution Panel Overview
DC Distribution Options

	Part number	Fuse position	Fuse type	Breaker position	Breaker type	Capacity	Mounting	Front access	RU	Additional options
Stand alone breaker / fuse panels	020-107-20	0		16/22	AM bolt-in	550A	19/23"	No	3	Gnd bar
	020-588-20	16*	TPS*	16	AM plug-in	400A	19/23"	Yes	5	Gnd bar, LVD
	020-589-20	20*	TPS*	20	AM plug-in	400A	23"	Yes	5	Gnd bar, LVD
	020-671-20	24*	TPS*	24	AM plug-in	600A	23"	No	3	
	020-675-20	18*	TPS*	18	AM plug-in	600A	19/23"	No	3	
	020-534-20	0		3	GJ bolt-in		19/23"	No	3	
	020-578-20	0		4	GJ bolt-in		23"	No	4	
	020-103-20	32	GMT	0		60A	19/23"	No	1	Gnd bar
	020-005-20	20	GMT	0		90A	19/23"	No	1	Gnd bar
	020-597-20	2	TPL	0		1200A	23"	No	4	Shunt
Universal Distribution Centers	020-702-20	18*	TPS*	18	AM plug-in	300A	19/23"	Yes	3	Controller I/O, LVD, Shunt, Batt breakers
	020-645-20	20-24*	TPS*	20-24	AM plug-in**	800A	23"	Yes	7	Controller, LVD, Shunt
		10	GMT							
	020-646-20	40-48*	TPS*	40-48	AM plug-in**	1000A	23"	Yes	9	Controller, LVD, Shunt
		10	GMT							
	020-635-20	80-96*	TPS*	80-96	AM plug-in**	2000A	23"	Yes	17	Controller, LVD, Shunt
		10	GMT							

Notes
*TPS fuses with AM plug-in breaker cartridges may be used as alternate to breakers
** Compatible with multiple pole AM plug-in breakers (110 to 250A)

Breakers

AM Series, Bolt-In Style Breakers	
Part number	Description
747-011-20	5 Amp w/ Jumper Kit
747-012-20	10 Amp w/ Jumper Kit
747-013-20	15 Amp w/ Jumper Kit
747-014-20	20 Amp w/ Jumper Kit
747-015-20	25 Amp w/ Jumper Kit
747-016-20	30 Amp w/ Jumper Kit
747-017-20	40 Amp w/ Jumper Kit
747-018-20	50 Amp w/ Jumper Kit
747-019-20	60 Amp w/ Jumper Kit
747-020-20	70 Amp w/ Jumper Kit
747-021-20	80 Amp w/ Jumper Kit
747-022-20	90 Amp w/ Jumper Kit
747-023-20	100 Amp w/ Jumper Kit

GJ Series, Bolt-In Style Breakers	
Part number	Description
470-120-10	100 Amp
470-125-10	125 Amp
470-188-10	150 Amp
470-171-10	175 Amp
470-121-10	200 Amp
470-081-10	225 Amp
470-228-10	250 Amp
470-122-10	300 Amp (2-Pole)
470-126-10	400 Amp (2-Pole)
470-210-10	450 Amp (3-Pole)
470-123-10	500 Amp (3-Pole)
470-219-10	600 Amp (3-Pole)
470-208-10	700 Amp (3-Pole)

AM Series, Plug-In Style Breakers	
Part number	Description
470-300-10	1 Amp, Mid-Trip
470-301-10	3 Amp, Mid-Trip
470-302-10	5 Amp, Mid-Trip
470-303-10	10 Amp, Mid-Trip
470-304-10	15 Amp, Mid-Trip
470-305-10	20 Amp, Mid-Trip
470-306-10	25 Amp, Mid-Trip
470-307-10	30 Amp, Mid-Trip
470-308-10	35 Amp, Mid-Trip
470-309-10	40 Amp, Mid-Trip
470-310-10	45 Amp, Mid-Trip
470-311-10	50 Amp, Mid-Trip
470-312-10	60 Amp, Mid-Trip
470-346-10	60 Amp, Series-Trip
470-370-10	65 Amp, Series-Trip
470-313-10	70 Amp, Mid-Trip
470-314-10	80 Amp, Mid-Trip
470-315-10	90 Amp, Mid-Trip
470-316-10	100 Amp, Mid-Trip
470-347-10	100 Amp, Series-Trip
747-220-20	110 Amp, Mid-Trip (2-Pole)
747-147-20	125 Amp, Mid-Trip (2-Pole)
747-148-20	150 Amp, Mid-Trip (2-Pole)
747-149-20	175 Amp, Mid-Trip (3-Pole)
747-150-20	200 Amp, Mid-Trip (3-Pole)
747-200-20	225 Amp, Mid-Trip (3-Pole)
747-221-20	250 Amp, Mid-Trip (3-Pole)

Fuses

GMT Series Fuses	
Part number	Description
460-004-10	0.5 Amp
460-006-10	1 Amp
460-081-10	1.33 Amp
460-082-10	1.5 Amp
460-083-10	2 Amp
460-013-10	3 Amp
460-085-10	4 Amp
460-084-10	5 Amp
460-105-10	7.5 Amp
460-069-10	10 Amp
460-150-10	15 Amp
520-046-10	GMT Fuse Cover

TPL Series Fuses	
Part number	Description
460-140-10	100 Amp
460-141-10	150 Amp
460-142-10	200 Amp
460-143-10	225 Amp
460-139-10	250 Amp
460-144-10	300 Amp
460-145-10	400 Amp
460-146-10	500 Amp
460-147-10	600 Amp
460-148-10	800 Amp

TPS Series Fuses	
Part number	Description
460-215-10	1 Amp
460-216-10	3 Amp
460-217-10	5 Amp
460-218-10	6 Amp
460-219-10	10 Amp
460-220-10	15 Amp
460-221-10	20 Amp
460-222-10	25 Amp
460-223-10	30 Amp
460-224-10	40 Amp
460-225-10	50 Amp
460-226-10	60 Amp
460-227-10	70 Amp
460-228-10	80 Amp
460-229-10	90 Amp
460-230-10	100 Amp
520-059-10	TPS Fuse Holder (AM plug-in breaker)

cordex
CXRF 48-1.8kW
AC
DC
ALM
cordex
CXRF 48-1.8kW
AC
DC
ALM

Cordex Rectifiers

Cordex rectifiers feature some of the most innovative DC power technology today. Expert engineering combines the maximum in efficiency and reliability into one compact unit. The new Cordex series have power density improvements of 200-300% over previous rectifiers and incorporate many new features.

Cordex rectifiers are available in a wide array of power sizes from 250 to 3600W per module, offering the most compact and cost effective power system design. Multiple DC output and AC input options are available to provide an ideal solution for most telecommunications and utility applications.

Combining a unique blend of advanced features, high reliability and greater efficiency, Cordex rectifiers offer significant operational and capital savings. High power diversity modules provide users with greater rack space for additional revenue generating equipment in space restricted environments. Fan cooled rectifier options are industry leading in terms of high temperature operation in harsh environments including outdoor enclosure solutions.

Cordex rectifiers are designed to operate seamlessly with the Cordex CXC system controllers for advanced configuration and local or remote system control and monitoring.

Cordex™ 250W
Modular Switched Mode Rectifier

CXRC 12-250W

- Available in 20.8A @ 12VDC
- Universal 120/208 to 240VAC input
- Power factor correction
- Convection cooled
- Hot swappable, 2RU ultra compact design

Electrical

Part number: 010-587-20

Input voltage: .....90 to 320VAC
Input frequency: .....45 to 70Hz
Power factor: .....>99%
THD: .....<5%
Efficiency: .....>90%
Power output: 250W
Output voltage: .....10.5 to 14.5VDC
Output current: .....18.5A @ 13.5VDC (20A max)
Load regulation: .....<±0.5% (static)
Line regulation: .....<±0.1% (static)
Transient response: ..... ±2% for 50 to 100% load step
2ms recovery time
Wide band noise: .....<30mVrms
<150mVp-p
Psophometric noise: .....<1mV

Mechanical

Dimensions:
mm: .....88.4H x 71.6W x 242D
inches: .....3.4H x 2.8W x 9.5D
Weight: 1.4kg (3lb)

Features

Indicators: .....AC mains OK—green LED
Module alarm—red LED

Cooling: .....Natural convection

Adjustments: .....Float and equalize voltage
(via CXCI controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay time
Slope %

Protection: .....Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Environmental

Temperature:
Operation: .....-40 to 50°C (-40 to 122°F)
(power de-rated up to 70°C/158°F)
Storage: .....-40 to 85°C (-40 to 185°F)
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 3000m (-1640 to 9840ft)
Heat dissipation: .....<94BTU per hour

Standards

The Cordex 250W is designed to meet the following:

Safety: .....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: .....ETSI 300 386
Emissions: .....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3

Immunity: .....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 400W
Modular Switched Mode Rectifier

CXRC 24-400W

- Available in 14A @ 24VDC
- Universal 120/208 to 240VAC input
- High efficiency and power factor correction
- Convection cooled
- Hot swappable, 2RU ultra compact design

Electrical

Part number: 010-582-20

Input voltage: .....90 to 320VAC
Input frequency: .....45 to 70Hz
Power factor: .....>99%
THD: .....<5%
Efficiency: .....>90%
Power output: .....400W (max)
Output voltage: .....20 to 29VDC
Output current: .....14A (current limited)
Load regulation: .....Static <±0.5%
Dynamic <±2% for 50 to 100% load step
2ms recovery time
Line regulation: .....Static <±0.1%
Dynamic <±1% for any change within rated limits
Wide band noise: .....<30mVrms
<150mVp-p
Psophometric noise: .....<1mV

Mechanical

Dimensions:
mm: .....88.4H x 71.6W x 242D
inches: .....3.4H x 2.8W x 9.5D
Weight: 1.4kg (3lb)

Features

Indicators: .....AC mains OK—green LED
Module alarm—red LED

Cooling: .....Natural convection

Adjustments: .....Float and equalize voltage
(via CXCI controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay time
Slope %

Protection: .....Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Environmental

Temperature:
Operation: .....-40 to 50°C (-40 to 122°F)
(power de-rated up to 70°C/158°F)
Storage: .....-40 to 85°C (-40 to 185°F)
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 3000m (-1640 to 9840ft)
Heat dissipation: .....<94BTU per hour

Standards

The Cordex 400W is designed to meet the following:

Safety: .....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: .....ETSI 300 386
Emissions: .....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3

Immunity: .....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 650W
Modular Switched Mode Rectifier

CXRC 48-650W

- Available in 13.5A @ 48VDC
- Universal 120V/208 to 240V single phase AC input
- Power limiting and wide range AC input
- 91% efficiency and power factor correction
- Convection cooled
- Hot swappable, 2RU ultra compact design

Electrical

Part number: ..... 120V model: 010-571-20
Universal 120/240 model: 010-570-20

Input voltage (120VAC model):
Operating: ..... 90 to 140VAC (output power 650W)
Extended: ..... 90 to 70VAC (de-rated output power)
Power output: ..... 650W at nominal 120VAC

Input voltage (universal 100 to 240VAC model):
Operating: ..... 176 to 320VAC (output power 650W)
Extended: ..... 176 to 90VAC (de-rated output power)
Operating: ..... 100 to 140VAC (output power 500W)
Power output: ..... 650W at nominal 208 to 240VAC & 500W at nominal 120VAC

Input frequency: ..... 45 to 70Hz
Power factor: ..... >99%
THD: ..... <5%
Efficiency: ..... >91% (1% loss for 120VAC model)
Output voltage: ..... 42 to 58VDC
Output current: ..... 12A @ 54VDC (13.5A max)
Load regulation: ..... Static <±0.5%
Dynamic <±2% for 50 to 100% load step
2ms recovery time
Line regulation: ..... Static <±0.1%
Dynamic <±1% for any change within rated limits
Wide band noise: ..... <30mVrms
<150mVp-p
Psophometric noise: ..... <1mV

Mechanical

Dimensions:
mm: ..... 88.4H x 71.6W x 242D
inches: ..... 3.4H x 2.8W x 9.5D
Weight: 1.4kg (3lb)

Features

Indicators: ..... AC mains OK—green LED
Module alarm—red LED
Cooling: ..... Natural convection
Adjustments: ..... Float and equalize voltage
(via CXCI controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay time
Slope %
Protection: ..... Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Environmental

Temperature:
Operation: ..... -40 to 50°C (-40 to 122°F)
(power de-rated up to 70°C/158°F)
Storage: ..... -40 to 85°C (-40 to 185°F)
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 3000m (-1640 to 9840ft)
Heat dissipation: ..... <94BTU per hour

Standards

The Cordex 650W is designed to meet the following:

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: ..... ETSI 300 386
Emissions: ..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3

Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 1kW
Modular Switched Mode Rectifier

- Available in 20.8A @ 48VDC
- Power limiting and wide range AC input
- 92% efficiency and power factor correction
- Convection cooled
- Hot swappable, 4RU ultra compact design

CXRC 48-1kW

Electrical

Part number: 010-566-20

Input voltage:
- Nominal: ..... 208 to 277VAC
- Operating: ..... 150 to 320VAC
- Extended: ..... 150 to 90VAC (de-rated power)

Input frequency: ..... 45 to 66Hz
Power factor: ..... >0.99
Efficiency: ..... >92%
Power output: ..... 1000W continuous/module
Output voltage: ..... 42 to 60VDC
Output current: ..... 18.5A @ 54VDC (20.8A max)
Load regulation: ..... <±0.5% (static)
Line regulation: ..... <±0.1% (static)
Transient response: ..... ±1% for 50 to 100% load step, 2ms recovery time

Noise:
- Voice band: ..... <32dBrnC
- Wide band: ..... <5mVrms
  <100mVpk to pk

Psophometric: ..... <1mV

Mechanical

Dimensions:
- mm: ..... 177H x 71W x 250D
- inches: ..... 6.9H x 2.8W x 9.8D

Weight: 2.9kg (6.4lb)

Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module alarm—red LED

Cooling: ..... Natural convection

Adjustments: ..... Float and equalize voltage
(via CXC Controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay timers
Slope %

Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Environmental

Temperature:
- Operation: ..... -40 to 50°C (-40 to 122°F)
  (with short periods up to 70°C/158°F)
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 4000m (-1640 to 13120ft)
Heat dissipation: ..... <295BTU per hour

Standards

The Cordex 1kW is designed to meet the following:

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: ..... ETSI 300 386
- Emissions: ..... CFR47 (FCC) Part 15 Class B
  ICES-03 Class B
  EN55022 (CISPR 22) Class B
  C-Tick (Australia)
  EN 61000-3-2
  EN 61000-3-3

- Immunity: ..... EN 61000-4-2
  EN 61000-4-3
  EN 61000-4-4
  EN 61000-4-5
  EN 61000-4-6
  EN 61000-4-11
  ANSI/IEEE C62.41 Cat B3
  EN 61000-4-11
  ANSI/IEEE C62.41 Cat B3

Cordex™ 1.8kW
Modular Switched Mode Rectifier

- Available in 37.5A @ 48VDC
- High power density
- Universal, wide range AC input
- 91% efficiency and power factor correction
- Hot swappable, 2RU ultra compact design

Cordex 48-1.8kW

Electrical

Part number: 010-580-20

Input voltage:
- Nominal: ..... 208 to 277VAC
- Operating: ..... 176 to 312VAC
- Extended: ..... 176 to 90VAC (de-rated power)

Input frequency: ..... 45 to 66Hz
Power factor: ..... >0.99 (50 to 100% load)
THD: ..... <5%
Efficiency: ..... >91%
Output voltage: ..... 42 to 60VDC
Output current: ..... 37.5A @ 48VDC (nominal I/p)
24A @ 48VDC (115 to 135VAC)
(de-rated linearly to 18.75A @ 90VAC)
Output power: ..... 1800W continuous @ nominal I/p
1150W (115 to 135VAC)
(de-rated linearly to 900W @ 90VAC)
Load regulation: ..... <±0.5% (static)
Line regulation: ..... <±0.1% (static)
Transient response: ..... ±2% for 50 to 100% load step,
2ms recovery time

Noise:
- Voice band: ..... <32dBrnC
- Wide band: ..... <30mV RMS (10kHz to 10MHz)
<150mV pk to pk (10kHz to 100MHz)

Psophometric: ..... <1mV
Acoustic: ..... <60dBa @ 1m (3ft)

Mechanical

Dimensions:
- mm: ..... 84H x 100W x 235D
- inches: ..... 3.3H x 3.94W x 9.25D

Weight: 2.8kg (6.2lb)

Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module fail—red LED
Controls: ..... CAN interface to CXC
Adjustments: ..... Float voltage
(via CXC controller) Equalize voltage
High voltage alarm
Low voltage alarm
High voltage shutdown
Current limit
Slope
Start delay timers
Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Environmental

Temperature:
- Standard: ..... -40 to 65°C (-40 to 149°F)
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m (-1640 to 9186ft)
Heat dissipation: ..... <608BTU per hour

Shelves

19/23" shelf
Part number: ..... 19/23" 4-module: 030-749-20
Dimensions:
- mm: ..... 89H x 438W x 310D
- inches: ..... 3.5H x 17.2W x 12.2D

Weight: 8.5kg (19lb)
Mounting: ..... 19" flush or center mount
23" center mount only

23" shelf
Part number: ..... 23" 5-module: 030-747-20
Dimensions:
- mm: ..... 89H x 541W x 310D
- inches: ..... 3.5H x 21.3W x 12.2D

Weight: 10kg (22lb)
Mounting: ..... 23" flush or center mount

Connections:
- Input: ..... Terminal blocks
Mini-fit connectors (23" only)
- Output: ..... Bus adapters with ⅜" on 1" center holes
- Chassis ground: ..... ¼" studs on ⅝" centers
- CAN communication: ..... RJ12 offset

Standards

The Cordex 1.8kW is designed to meet the following:

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: ..... ETSI 300 386
- Emissions: ..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
- Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 3.1/3.6kW
Modular Switched Mode Rectifier

- Available in 130A @ 24VDC or 75A @ 48VDC
- High power density, over 21kW per 23" shelf
- Power limiting and wide range AC input
- High efficiency and power factor correction
- Hot swappable, 4RU ultra compact design

CXRF 24-3.1kW

Electrical

3.1kW Rectifier Module(s)

Part number: 010-572-20

Input voltage:
- Nominal: .....208 to 277VAC
- Operating: .....176 to 312VAC
- Extended: .....176 to 90VAC (de-rated power)

Input frequency: .....45 to 70Hz
Power factor: .....>0.99 (50 to 100% load)
THD: .....<5%
Efficiency: .....>90%
Output voltage: .....21 to 29VDC
Output power: .....3100W continuous/module
Output current: .....115A @ 27VDC (130A max. 24V)
Load regulation: .....<±0.5% (static)
Line regulation: .....<±0.1% (static)
Transient response: .....±2% for 50 to 100% load step, 2ms recovery time

Noise:
- Voice band: .....<32dBrnC
- Wide band: .....<30mV RMS (10kHz to 10MHz)
  <150mV pk to pk (10kHz to 100MHz)

Psophometric: .....<1.0mV
Acoustic: .....<60dBa @ 1m (3ft)

3.6kW Rectifier Module(s)

Part number: 010-567-20

Input voltage:
- Nominal: .....208 to 277VAC
- Operating: .....176 to 312VAC
- Extended: .....176 to 90VAC (de-rated power)

Input frequency: .....45 to 66Hz
Power factor: .....>0.99 (50 to 100% load)
THD: .....<5%
Efficiency: .....>92%
Output voltage: .....42 to 60VDC
Output power: .....3600W continuous/module
Float voltage: .....48 to 58VDC
Output current: .....66A @ 54VDC (75A max 48V)
Load regulation: .....<±0.5% (static)
Line regulation: .....<±0.1% (static)
Transient response: .....±2% for 50 to 100% load step, 2ms recovery time

Noise:
- Voice band: .....<32dBrnC
- Wide band: .....<30mV RMS (10kHz to 10MHz)
  <150mV pk to pk (10kHz to 100MHz)

Psophometric: .....<1mV
Acoustic: .....<60dBa @ 1m (3ft)

Mechanical

Dimensions:
- mm: .....160H x 87W x 300D
- inches: .....6.3H x 3.4W x 11.8D

Weight: 4.6kg (10lb)

Features

Indicators: .....AC mains OK—green LED
Module OK—green LED
Module fail—red LED
Controls: .....CAN interface to CXC
Adjustments: .....Float voltage
(via CXC controller) Equalize voltage
High/low voltage alarm
High voltage shutdown
Current limit
Slope
Start delay
Protection: .....Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback shutdown

Environmental

Temperature:
- Standard: .....-40 to 65°C (-40 to 149°F)
- Storage: .....-40 to 85°C (-40 to 185°F)

Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 4000m (-1640 to 13120ft)
Heat dissipation: .....<1176BTU per hour

Standards

Safety: .....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1
EMC: .....ETSI 300 386
Emissions: .....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
Immunity: .....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3
NEBS: .....GR-1089 CORE
GR-69 CORE

cordex
CXRC 125-1.1kW
cordex
CXRC 125-1.1kW
AC
DC

High Voltage Solutions

Argus High Voltage DC rectifiers and systems bring advanced Cordex technology and features to the utility and industrial markets.

Available in both 125VDC and 220VDC output, Cordex high voltage modules are a perfect fit for many applications including power utility and petrochemical switch gear control systems. High density switch mode rectifier modules provide substantial space savings over traditional ferro resonant designs.

The Cordex CXC controller provides the high voltage rectifiers with a single point setup for alarming and control, along with many advanced features including remote IP and SNMP connectivity. Multiple battery monitoring features are standard with the CXC including capacity and runtime prediction. Multiple CXC peripherals are optionally available for detailed monitoring of cell voltage, string voltage, temperature and string current on high voltage DC battery strings.

Available in 1.1kw and 4.4kw modules, the Cordex 125/220V rectifiers provide a great combination of advanced features and high power density for a wide range of high voltage DC power system capacities.

Cordex™ 1.1kW 125VDC
Modular Switched Mode Rectifier

- 8.8A output @ 125VDC
- Power limiting and wide range AC input
- 93% efficiency with power factor correction
- Convection cooled
- Hot swappable, 4RU ultra compact design

CXRC 125-1.1kW

Electrical

Part number: 010-579-20

Input voltage:
- Nominal: ..... 208 to 277VAC
- Operating: ..... 176 to 320VAC
- Extended: ..... 176 to 150VAC (de-rated to 75%)

Input frequency: ..... 45 to 66Hz
Power output: ..... 1100W continuous/module
Power factor: ..... >0.99 (input current)
THD: ..... <5%
Efficiency: ..... >93%
Output voltage: ..... 90 to 180VDC
Output current: ..... 8.8A @ 125VDC (11A max)
Load regulation: ..... Static <±0.5%
Line regulation: ..... Static <±0.1%
Transient response: ..... <±2% for 50 to 100% load step, 10ms recovery time
Wide band noise: ..... <30mVrms
<150mVp-p
Insulation: ..... 2.5kVAC input-earth
3kVAC input-output
2kVAC output-earth
0.5kVAC signals-earth

Mechanical

Dimensions:
- mm: ..... 177H x 71W x 250D
- inches: ..... 6.9H x 2.8W x 9.8D

Weight: 2.9kg (6.4lb)

Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module alarm—red LED

Cooling: ..... Natural convection

Adjustments: ..... Float and equalize voltage
(via CXC controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay time
Slope %

Protection: ..... Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown
Earth leakage alarm

Environmental

Temperature:
- Operation: ..... -40 to 50°C (-40 to 122°F)
(up to 70°C/158°F power de-rated)
- Storage: ..... -50 to 85°C (-58 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 4000m (-1640 to 13120ft)
Heat dissipation: ..... <282BTU per hour (max)

Shelves

19" shelf (6 module)
Part number: 030-740-20

Dimensions:
- mm: ..... 177H x 444W x 303D
- inches: ..... 6.9H x 17.5W x 11.9D

Weight: 7.3kg (16lb)
Mounting: ..... Fits 19" rack flush mount
Fits 19" or 23" center mount

Connections:
- Input: ..... Terminal blocks for 3 feeds
4–6mm² (12–10AWG)
- Output: ..... ¼" studs on ⅝" centers
- Chassis ground: ..... ¼" stud
- CAN communication: ..... RJ 12 offset

Standards

The Cordex 1.1kW is designed to meet the following:

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: ..... ETSI 300 386
- Emissions: ..... CFR47 (FCC) Part 15 Class A
ICES-03 Class A
EN55022 (CISPR 22) Class A
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
- Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 1.1kW 220VDC
Modular Switched Mode Rectifier

CXRC 220-1.1kW

- 5A output @ 220VDC
- Power limiting and wide range AC input
- 93% efficiency with power factor correction
- Convection cooled
- Hot swappable, 4RU ultra compact design

Electrical

Part number: 010-569-20

Input voltage:
- Nominal: .....208 to 277VAC
- Operating: .....176 to 320VAC
- Extended: .....176 to 150VAC (de-rated to 75%)

Input frequency: .....45 to 66Hz
Power output: .....1100W continuous/module
Power factor: .....>0.99 (input current)
THD: .....<5%
Efficiency: .....>93%
Output voltage: .....180 to 320VDC
Output current: .....5A @ 220VDC (5.5A max)
Load regulation: .....Static <±0.5%
Line regulation: .....Static <±0.1%
Transient response: .....<±2% for 50 to 100% load step, 10ms recovery time
Wide band noise: .....<30mVrms
<150mVp-p
Insulation: .....2.5kVAC input-earth
3kVAC input-output
2kVAC output-earth
0.5kVAC signals-earth

Mechanical

Dimensions:
- mm: .....177H x 71W x 250D
- inches: .....6.9H x 2.8W x 9.8D

Weight: 2.9kg (6.4lb)

Features

Indicators: .....AC mains OK—green LED
Module OK—green LED
Module alarm—red LED

Cooling: .....Natural convection

Adjustments: .....Float and equalize voltage
(via CXC controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay time
Slope %

Protection: .....Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown
Earth leakage alarm

Environmental

Temperature:
- Operation: .....-40 to 50°C (-40 to 122°F)
(up to 70°C/158°F power de-rated)
- Storage: .....-50 to 85°C (-58 to 185°F)

Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 4000m (-1640 to 13120ft)
Heat dissipation: .....<282BTU per hour (max)

Shelves

19" shelf (6 module)
Part number: 030-718-20

Dimensions:
- mm: .....177H x 444W x 303D
- inches: .....6.9H x 17.5W x 11.9D

Weight: 7.3kg (16lb)
Mounting: .....Fits 19" rack flush mount
Fits 19" or 23" center mount

Connections:
- Input: .....Terminal blocks for 3 feeds
4–6mm² (12–10AWG)
- Output: .....¼" studs on ⅝" centers
- Chassis ground: .....¼" stud
- CAN communication: .....RJ 12 offset

Standards

The Cordex 1.1kW is designed to meet the following:

Safety: .....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: .....ETSI 300 386
- Emissions: .....CFR47 (FCC) Part 15 Class A
ICES-03 Class A
EN55022 (CISPR 22) Class A
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
- Immunity: .....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 3.3kW System

125/220V High Voltage Integrated Systems

- 26.4A system capacity @ 125V
- 15A system capacity @ 220V
- Cordex 1.1kW modular rectifiers (125 or 220V)
- Wide range AC input
- Front accessible for rack or wall mounting
- Ethernet and SNMP communications
- Designed for industrial and utility applications

Cordex 125-3.3kW system

Electrical

Part number: 125V: 030-788-20
220V: 030-789-20
Input voltage:
Nominal: ..... 208 to 277VAC
Operating: ..... 176 to 320VAC
Extended: ..... 176 to 150VAC (de-rated to 75%)
Phase: ..... 1 or 3
Frequency: ..... 45 to 66Hz
Power factor: ..... >0.99
Efficiency: ..... >93% (50 to 100% load)
Output voltage: ..... 90 to 160VDC
Current: ..... 8.8A per module @ 125VDC,
5A per module @ 220VDC,
up to 3 modules per shelf
Load regulation: ..... Static <+0.5%
Line regulation: ..... Static <+0.1%
Transient response: ..... <+2% for 10 to 100% load step.
10ms recovery time.
Wide band noise: ..... <10mVrms
<80mVp-p
Insulation: ..... 2.5kVAC input-earth
3kVAC input-output
2kVAC output-earth
0.5kVAC signals-earth

Mechanical

Charger enclosure: ..... Wall or rack mount
Dimensions:
inches: ..... 12.2H x 17.1W x 11.9D
mm: ..... 309H x 434W x 302D
Weight: ..... 12.59kg (27.76lb)*
Enclosure: ..... NEMA 1 (charcoal finish)

Features

User interface:
GUI: ..... Use Internet Explorer browser to access GUI through ethernet or RS-232 port
Display: ..... Full graphic LCD, 160 x 160 pixels, with backlight and contrast adjustment
Controls: ..... LCD touch screen with virtual alpha numeric and numeric keyboards
Indicators: ..... System OK—green LED
Minor alarm—yellow LED
Major alarm—red LED
Audio: ..... Built in speaker for alarms and messages
Language: ..... Multi language support including Chinese
Communication ports:
RS-232 (DB-9): ..... Craft port on front panel for local PC connection
CAN OUT (RJ-12 offset): CAN communication BUSS to optional smart peripheral modules
RS-485 (RJ-12 offset): .... For future service options
Ethernet (RJ-45): ..... 10/100 Base T with half/full duplex

Alarms:
Output: ..... 6 potential free form C contacts
Input: ..... 4 digital inputs
GFD: ..... Ground fault detect
SNMP: ..... SNMP agent provides real time system status to the network management software
Data logging:
Daily statistics: ..... Minimum, maximum and average on input channels, with date and time stamp
Battery current, rectifier current, and AC mains voltage for last 90 days
Event log: ..... On all events such as alarms, power on, any change of state of the digital inputs, or other miscellaneous events
Battery log: ..... Battery health history on last 20 discharges, time of discharge, and battery capacity
Control functions: ..... Automatic, scheduled (periodic) or manual equalize
Automatically terminated equalize charge
Battery current terminate equalize
Dynamic charge current control
Battery capacity and runtime prediction
Auto or manual battery test

DC Output Panel: ..... 2 x 2 Pole, 32A breakers (10KAIC) with alarm monitoring

AC Input (not a service entrance):
Single phase: ..... 1 x 2-pole 10KAIC (30KAIC option)
Three phase: ..... 1 x 3-pole delta connection 10KAIC
1 x 3-pole wye connection 10KAIC

Environmental

Temperature range:
Operating: ..... -40 to 50˚C (-40 to 122˚F)
Extended: ..... Rectifier de-rated to 600W @ 65˚C (149˚F)
Humidity: ..... 0 to 95% RH non-condensing
Cooling: ..... Natural convection
Heat dissipation: ..... <900BTU per hour/system

Standards

Safety: ..... UL 60950 3rd editions, CSA C22.2 No. 60950-00 3rd edition
EN 60950
CE

EMC: ..... ICES-003 Class A
FCC Part 15, Class A, FCC Part 68
EN 55022 Class AA (CISPR 22)
EN 61000-4-2 ESD
EN 61000-4-3 Radiated Immunity
EN 61000-4-4 EFRT/Burst
EN 61000-4-6 Conducted Immunity

*Rectifier module not included system weight

Cordex™ 4.4kW
Modular Switched Mode Rectifier

CXRF 4.4kW

- Available in 35A @ 125VDC or 20A @ 220VDC
- High power density, over 26kW per 23" shelf
- Power limiting and wide range AC input
- 92% efficiency and power factor correction
- Hot swappable, 4RU ultra compact design

Electrical

Part number: 125V: 010-589-20
220V: 010-588-20
Input voltage:
Nominal: ..... 208 to 240VAC
Operating: ..... 187 to 312VAC
Extended: ..... 187 to 90VAC (de-rated)
Input frequency: ..... 45 to 70Hz
Power: ..... 4400W continuous/module
Power factor: ..... >0.99 (50 to 100% load)
THD: ..... <5%
Efficiency: ..... >92%
Output voltage:
125V module: ..... 90 to 160VDC
220V module: ..... 180 to 320VDC
Output current:
125VDC module: ..... 35A@ 125VDC (40A @ 110VDC max)
220VDC module: ..... 20A @ 220VDC
Load regulation: ..... Static <±0.5%
Line regulation: ..... Static <±0.1%
Transient response: ..... <±5% for 40 to 90% load step, 30ms recovery time
Wide band noise: ..... 220VDC module: <30mVrms
<300mVp-p
125VDC module: <90mVrms
<700mVp-p
Insulation: ..... 2.5kVAC input-earth
3kVAC input-output
2kVAC output-earth
0.5kVAC signals-earth
Acoustic: ..... <60dBa @ 1m (3ft)

Mechanical

Dimensions:
mm: ..... 160H x 87W x 300D
inches: ..... 6.3H x 3.4W x 11.8D
Weight: 4.65kg (10.57lb)

Features

Indicators: ..... AC mains OK — green LED
Module OK — green LED
Module fail — red LED
Controls: ..... CAN interface to CXC
Adjustments: ..... Float voltage
(via CXC controller) Equalize voltage
High & low voltage alarms
High voltage shutdown
Current limit
Slope
Start delay
Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback shutdown

Environmental

Temperature:
Standard: ..... -40 to 50°C (-40 to 130°F)
Extended: ..... -40 to 75°C (-40 to 167°F)
Storage: ..... -40 to 85°C (-40 to 185°F)
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m (-1640 to 9186ft)
Heat dissipation: ..... <1080BTU per hour

Shelves

19/23" shelf
Part number: ..... 125V 19" 5-module: 030-769-20
220V 19" 5-module: 030-768-20
Dimensions:
mm: ..... 177H x 442W x 389D
inches: ..... 6.9H x 17.4W x 15.3D
Weight: 8.5kg (19lb)
Mounting: ..... Fits 19" rack flush/center mount (5 modules)
Fits 23" rack center mount only

23" shelf
Part number: ..... 125V 23" 6-module: 030-767-20
220V 23" 6-module: 030-766-20
Dimensions:
mm: ..... 177H x 530W x 389D
inches: ..... 6.9H x 20.8W x 15.3D
Weight: 9.5kg (21lb)
Mounting: ..... Fits 23" racks only flush/center mount
(6 modules)

Connections:
Input: ..... Box type terminal block
6 to 16mm² (10 to 6AWG)
Output: ..... Bus adapters with ⅜" studs on 1" centers
Chassis ground: ..... Compression lug
6 to 16mm² (10 to 6AWG)
CAN communication: ..... RJ12 offset

Standards

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1
EMC:
Emissions: ..... CFR47 (FCC) Part 15 Class A
ICES-03 Class A
EN55022 (CISPR 22) Class A
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

OUTPUTS
+
10 20
5 15 24
CURRENT (A)
V
I
CSM 11
DC/DC CONVERTER
PART Nº 012-548-20
INPUT 24VDC
OUTPUT 48VDC
O/I
ON
FAIL
INPUT
ARGUS

Converters

Argus modular, hot swappable DC-DC converters are the ideal solution for providing dual voltage capability in new systems – or upgrades to existing DC plants for a variety of applications.

Modular 24V-48V and 48V-24V converters are available options for DC systems to provide support for various applications and markets including wireless. Whether intended to support legacy cellular equipment, or enhance a network with GSM and UMTS overlays, Argus converters allow flexibility with powering approaches, allowing users to maintain a single voltage battery system.

Argus CSM35 and CSM36 series converters are reliable and field proven options for remote network powering. Using a high DC voltage to transmit power over long distances using an existing twisted pair copper infra-structure, these converters are a great solution for remote site powering where AC utility is not available, or battery maintenance is cost prohibitive. CSM3x converters are perfect for FTTx, FITL (Fiber In The Loop), xDSL, and many other applications.

Whether to allow dual voltage system support, or providing network powering services, Argus converters provide a cost effective and reliable option for DC power systems.

CSM01
Modular DC to DC Converter

CSM01

- 24VDC to 48VDC, 5A output
- 4RU vertical mount — 5 modules in 19", 6 modules in 23"
- 2RU horizontal mount — 2 modules in 19", 3 modules in 23"
- Scalable hot plug-in operation
- Convection cooled

Electrical

Part number: .....Horizontal: 012-512-20
Vertical: 012-501-20

Input voltage: .....20 to 30VDC
Output voltage:.....44 to 52VDC
Output current:.....5A
Efficiency:.....>85% (100% load)
Regulation:.....-1%, +/-0.1% load (static)
+/-0.1% line (static)
<2% deviation for 50 to 100% load step (dynamic)
Response time:.....2ms to 0.1% of output for 50 to 100% load step
Noise:
Voice band: .....<22dBrnC
Wide band: .....<10mV RMS (10kHz to 10MHz)
<150mV pk to pk (10kHz to 100MHz)
Acoustic: .....45 dBa at 1m (3ft)

Environmental

Temperature:.....0 to 50°C (32 to 122°F) with specified ventilation
-40 to 50°C (-40 to 122°F) (optional)
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 2800m (-1640 to 9186ft)
Indicators: .....Power on
Output over voltage protection trip
Bar graph output current
Converter fail
Current limit
Alarms:.....Converter fail alarm†
Adjustments:.....Output voltage
Protection:.....Input fuse
Input inrush current limiting
Over temperature limiting
Input high and low voltage shutdown
Output paralleling diode
Current limit/short circuit protection

Shelves

Mechanical

Connections:
Input/output:.....Two ¼" studs on ⅝" centers
Alarm/control:.....Terminal block
0.5mm² to 1.5mm² (#20 to 16AWG)

10A (2-module horizontal 19")

Part number: 030-529-20
Dimensions:
mm:.....90H x 432W x 305D
inches:.....3.5H x 17W x 12D
Weight: .....8.4kg (18.5lb) e/w 2 power modules

15A (3-module horizontal 23")

Part number: 030-528-20
Dimensions:
mm:.....90H x 508W x 305D
inches:.....3.5H x 20W x 12D
Weight:.....10.9kg (24lb) e/w 3 power modules

25A (5-module vertical 19")

Part number: 030-526-20
Dimensions:
mm:.....178H x 432W x 305D
inches:.....7H x 17W x 12D
Weight:.....16.6kg (36lb) e/w 5 power modules

30A (6-module vertical 23")

Part number: 030-523-20
Dimensions:
mm:.....178H x 508W x 305D
inches:.....7H x 20W x 12D
Weight:.....19.5kg (43lb) e/w 6 power modules

Input Module 25 and 30A versions

Part number: 012-507-20
Indicators: .....Circuit breaker trip
Alarms:.....Circuit breaker trip alarm†

Distribution Fuse Module 10, 25 and 30A versions

Part number: 012-509-20
Indicators: .....Output fuse fail
Alarms:.....Output fuse alarm†
Fuse block:.....8 position 0 to 10A GMT fuses (25 & 30A versions)
4 position 0 to 10A GMT fuses (10A version)
Connections:.....Terminal block
0.75 mm² to 4 mm² (#18 to #12 AWG)

Analog Supervisory Module 25 and 30A versions

Part number: 012-508-20
Indicators: .....Major alarm
System over voltage protection trip
System high voltage alarm
System low voltage alarm
Test mode
Digital voltmeter/ammeter
Alarms:.....Major alarm†
Low voltage alarm†
High voltage alarm†
Adjustments:.....Over voltage protection
High voltage alarm
Low voltage alarm
Test/normal selector

† Jumper selectable form A/B contacts

Standards

EN: .....55022 - Class A (radiated)
FCC:.....Part 15 Class A (radiated)

CSM02
Modular DC to DC Converter

CSM02

- 48VDC to 24VDC, 10A output
- 4RU vertical mount — 5 modules in 19", 6 modules in 23"
- 2RU horizontal mount — 2 modules in 19", 3 modules in 23"
- Scalable hot plug-in operation
- Convection cooled

Electrical

Part number .....Horizontal: 012-514-20
Vertical: 012-502-20

Input voltage: .....40 to 60VDC
Output voltage:.....22 to 26VDC
Output current:.....10A
Efficiency:.....>85% (100% load)
Regulation:.....-1%, +/-0.1% load (static)
+/-0.1% line (static)
<2% deviation for 50 to 100% load step (dynamic)
Response time:.....2ms to 0.1% of output for 50 to 100% load step
Noise:
Voice band: .....<22dBrnC
Wide band:.....<10mV RMS (10kHz to 10MHz)
<150mV pk to pk (10kHz to 100MHz)
Acoustic: .....45 dBa at 1m (3ft)

Environmental

Temperature:.....0 to 50°C (32 to 122°F) with specified ventilation
-40 to 50°C (-40 to 122°F) (optional)
Humidity:.....0 to 95% RH non-condensing
Elevation: .....-500 to 2800m (-1640 to 9186ft)
Indicators: .....Power on
Output over voltage protection trip
Bar graph output current
Converter fail
Current limit
Alarms:.....Converter fail alarm†
Adjustments:.....Output voltage
Protection:.....Input fuse
Input inrush current limiting
Over temperature limiting
Input high and low voltage shutdown
Output paralleling diode
Current limit/short circuit protection

Shelves

Mechanical
Connections:
Input/output:.....Two ¼" studs on ⅝" centers
Alarm/control:.....Terminal block
0.5mm² to 1.5mm² (#20 to 16AWG)

20A (2-module horizontal 19")
Part number: 030-538-20
Dimensions:
mm:.....90H x 432W x 305D
inches:.....3.5H x 17W x 12D
Weight:.....8.4kg (18.5lb) e/w 2 power modules

30A (3-module horizontal 23")
Part number: 030-542-20
Dimensions:
mm:.....90H x 508W x 305D
inches:.....3.5H x 20W x 12D
Weight:.....10.9kg (24lb) e/w 3 power modules

50A (5-module vertical 19")
Part number: 030-534-20
Dimensions:
mm:.....178H x 432W x 305D
inches:.....7H x 17W x 12D
Weight:.....16.6kg (36lb) e/w 5 power modules

60A (6-module vertical 23")
Part number: 030-520-20
Dimensions:
mm:.....178H x 508W x 305D
inches:.....7H x 20W x 12D
Weight:.....19.5kg (43lb) e/w 6 power modules

Input Module 50 and 60A versions
Part number: 012-513-20
Indicators: .....Circuit breaker trip
Alarms:.....Circuit breaker trip alarm†

Distribution Fuse Module 20, 50 and 60A versions
Part number: 012-509-20
Indicators: .....Output fuse fail
Alarms:.....Output fuse alarm†
Fuse block:.....8 position 0 to 10A GMT fuses (50 & 60A versions)
4 position 0 to 10A GMT fuses (20A version)
Connections:.....Terminal block
0.75 mm² to 4 mm² (#18 to #12 AWG)

Analog Supervisory Module 50 and 60A versions
Part number: 012-508-20
Indicators: .....Major alarm
System over voltage protection trip
System high voltage alarm
System low voltage alarm
Test mode
Digital voltmeter/ammeter
Alarms:.....Major alarm†
Low voltage alarm†
High voltage alarm†
Adjustments:.....Over voltage protection
High voltage alarm
Low voltage alarm
Test/normal selector

† Jumper selectable form A/B contacts

Standards

EN: .....55022 - Class A (radiated)
FCC:.....Part 15 Class A (radiated)

CSM11
Modular DC to DC Converter

- 24 to 48VDC, 24A output
- 3RU high-density module
- Up to 3 modules per 19" or 4 modules per 23" shelves
- Scalable hot plug-in operation
- Bar graph output current indicator

CSM11

Electrical

Part number: 012-548-20

Input voltage: .....20 to 30VDC
Output voltage:.....44 to 52VDC
Output current:.....24A max
Power: .....1250W max
Efficiency:.....>88% (50 to 100% load)
90% typical
Regulation:.....-1% ±0.1% load (static)
±0.1% line (static)
<1% deviation for 50 to 100% load step (dynamic)
Response time:.....<2ms to 0.1% of output for 50 to 100% load step
Noise:
Voice band: .....<22dBrnC
Wide band:.....<10mV RMS to 10MHz
<150mVp-p to 100MHz
Psophometric:.....<0.5mV
Acoustic: .....<60dBa @ 1m (3ft)

Mechanical

Connections:.....Bullet terminals
Weight:.....4.6kg (10lb)
Dimensions:
mm:.....127H x 130W x 349D
inches: .....5H x 5.12W x 13.75D

Features

Indicators: .....Power on
DC input OK
Bar graph output current
Converter fail alarm major
Converter fail alarm minor
Current limit
Adjustments: .....Output voltage
Current limit
Test points:.....Module voltage
Protection:.....Input fuse
Input inrush current limiting
Output fuse
Output paralleling diode
Over temperature limiting
Input high and low voltage shutdown
Current limit/short circuit protection

Environmental

Temperature:.....0 to 65°C (32 to 149°F) (standard operating)
Optional:.....-40 to 65°C (-40 to 149°F) (extended operating)
Humidity:.....0 to 95% RH non-condensing
Elevation: .....-500 to 2800m (-1640 to 9186ft)

Shelves

19" shelf (3 modules)
Part number: 030-650-20
Dimensions:
mm:.....132H x 432W x 362D
inches: .....5.2H x 17W x 14.25D
Weight:.....8.2kg (18lb)

23" shelf (4 modules)
Part number: 030-651-20
Dimensions:
mm:.....132H x 533W x 362D
inches: .....5.2H x 21W x 14.25D
Weight:.....9.1kg (20lb)

Connections
Input: .....2-hole ¼" studs on ⅝" centers (per module)
Output: .....2 x ⅜" threaded inserts on 1" centers
Alarms:.....Terminal block
0.34 to 2.5mm² (22 to 14AWG)

Features
Alarms:.....Converter fail alarm major
Converter fail alarm minor
(jumper selectable form A/B contacts)

Standards

CSA:.....C22.2 950-95 (NRTL/C)
UL:.....1950 (NTRL)
CE:.....IEC/EN 60950
FCC:.....47 CFR part 15
Class A radiated EMI
Class B conducted EMI
EN: .....55022 (CISPR 22)
Class A radiated EMI
Class B conducted EMI
61000-4-2, -3, -4, -6
60950 (CE)
ENV: 50204
Bellcore: GR-63-CORE
Vibration and shock
NEBS:.....Certified for 19" shelf configuration

23" CSM11 Shelf

CSM35/36
Modular DC to DC Converters

- Remote equipment powering over multiple copper pairs
- 48VDC to +/-137VDC (CSM35)
- 48VDC to +/-190VDC (CSM36)
- Two 100VA circuits per power module
- Up to 2400W per 19" shelf
- Scalable hot plug-in operation

CSM35 19" converter shelf

Electrical

Part number: CSM35: 012-550-20
CSM36: 012-552-20

Input voltage: ..... -40 to -60VDC
Output voltage: ..... ±137VDC (CSM35)
±190VDC (CSM35)
Power: ..... 90W minimum per output
Efficiency: ..... >88% (50 to 100% load)
90% typical
Regulation: ..... <-0.5% no load to full load
<±0.05% line
Noise:
Wide band: ..... <300mVp-p to 100MHz
<100mVRMS to 10MHz
Acoustic: ..... <60dBa @ 1m (3ft)

Mechanical

Power module
Dimensions:
mm: ..... 114H x 31.75W x 254D
inches: ..... 4.5H x 1.25W x 10D

Features

Indicators: ..... Power on
DC input OK
Converter fail alarm major
Converter fail alarm minor
Current limit
Protection: ..... Power limiting
Input/output fuses
Input inrush current limiting
Output transient and OSP
Input high and low voltage shutdown
Current limit/short circuit fold back
Thermal shutdown
Input transient
5mA ground fault interrupt option

Environmental

Temperature:
Optional: ..... -40 to 65°C (-40 to 149°F)*
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m (-1640 to 9186ft)

*Fan module required for high temp operation above 50°C (122°F)

Shelves

19" shelf (12 modules)
Part number: CSM35: 030-695-20
CSM36: 030-702-20
Dimensions:
mm: ..... 132H x 432W x 314D
inches: ..... 5.2H x 17W x 12.36D
Weight: ..... 11.4kg (25lb) fully equipped

Shelf cooling (48VDC fan tray)
Part number: ..... Shelf list option 99

Top air baffle
Part number: ..... Shelf list option 96

Analog supervisory module
Part number: CSM35: 018-561-20
CSM36: 018-562-20
Alarm relays: ..... Form C major
Form C minor
LED: ..... System ok (green)
Minor alarm (yellow)
Major alarm (red)

Standards

CSA: ..... C22.2 60950-1 (NRTL/C)
UL: ..... 60950-1 (NTRL)
FCC: ..... 47 CFR part 15
Class B radiated EMI
Class A conducted EMI
EN: ..... 55022 (CISPR 22)
Class B radiated EMI
Class A conducted EMI
61000-4-2, -3, -4, -6
60950 (CE)
Bellcore: GR-63-CORE
GR-1089-CORE
GR-1089 Class A2 (with GFI) or A3
NEBS: ..... *Consult factory on system application*

CSM46
+/-190VDC to -48VDC Converter

- Down converter for line powering solutions
- 2x +/-190V, 100VA inputs per module
- Compact 1RU, scalable hot plug-in operation
- Front access test points and LED indication
- High reliability convection-cooled design

CSM46 10-Module shelf

Electrical

Part number: 012-554-20

Input voltage: .....195 to 380VDC (+/- 97.5 to +/- 190VDC)
Input current:.....240mA +/- 2%
Efficiency:.....>85%
Output power:.....Up to 75 watts
(de-rates linearly with input voltage)
Output voltage:.....-50 to -55VDC
Output current:.....1.5A max
(de-rates linearly with input voltage)
Noise: .....<500mv p-p to 20MHz
<250mVrms to 20MHz

Mechanical

Dimensions:
mm:.....42H x 23W x 280D
in:.....1.65H x .9W x 11D
Weight:.....0.67kg (1.5lb)

Environmental

Temperature:.....-40 to +75°C (-40 to 167°F) with external airflow
Humidity:.....0 to 95% NC

Features

Indicators:
Converter A: .....I/P OK (green LED)
Converter A: .....O/P OK (green LED)
Converter B: .....I/P OK (green LED)
Converter B: .....O/P OK (green LED)
Test points:
Converter A: .....I/P voltage
Converter B: .....I/P voltage
Protection:.....Input fuses
Input current limit
Input transient portection
Input high and low voltage shutdown
Thermal shutdown
Output or'ing diodes
Output OVP
Reverse polarity protection
Miscellaneous:.....Alarm masking switch for disabling shelf level alarming

Shelves

10-Module shelf part number:...030-831-20

Mechanical

Dimensions:
mm:.....45H x 273W x 311D
in:.....1.75H x 10.75W x 12.25D
(excludes connectors and mounting brackets)
Weight:.....4.87kg (10.8lb)

Features

Access:.....Front access
Connections:
Input: .....50-pin amp-champ style connector and wireharness
Output: .....Anderson SBS50 and molex style options and wireharness
Alarm: .....Flying leads or molex style connector and wireharness
Chassis gnd: .....¼" studs on ⅝"C
Alarms:.....Major form C relay
Minor form C relay
Note: Relays are field replaceable

Standards

Safety:.....CSA/UL 60950-1
CSA/UL 60950-21
CE IEC/EN 60950
EMI:.....Class A radiated
GR-1089 issue 3 (applicable sections)

CXDF 24-48/2kW
Cordex Series DC-DC Converters

- 24V to 48VDC, 2kW output per module
- High power density, hot swappable converters
- Control and monitor via Cordex controller
- Optional integrated CXCI controller option
- Optional busbar integration into Argus CXPS systems

CXDF 24-48/2kW
Converter Module

Electrical

Part number: 012-526-20

Input voltage: .....21 to 30VDC
Input current:.....Up to 94A @ 24V
Efficiency:.....>88%
Input noise:
Voice band:.....<32dBrnC
Wide band: .....<10mV RMS to 10MHz
<150mVp-p to 100MHz
Output power:.....2000W max @ -54V
Output voltage:.....-54VDC nominal
Output current:.....37A max
Regulation:.....-1% +/-0.1% load (static)
+/- 0.1% line (static)
Output noise:
Voice band:.....<38dBrnC
Wide band: .....<10mV RMS to 10MHz
<150mVp-p to 100MHz
Acoustic noise:.....<60dBa @ 1m (3ft)

Mechanical

Dimensions:
mm:.....84H x 100W x 235D
in:.....3.3H x 3.94W x 9.25D
Weight:.....2.8kg (6.2lb)

Features

Indicators: .....Input ok LED (green)
Output ok LED (green)
Module fail LED (red)
Adjustments:.....Via CXC controller
Protection:.....Input fuse
Input inrush current limit
Output fuse
Over temperature limiting
Input high and low voltage shutdown
Current limit/short circuit protection
Miscellaneous:.....Control and monitoring via CXC controller
(requires v1.96 min)
Low voltage cutoff (LVD)

Environmental

Temperature:.....-40 to +55°C (de-rated power up to 75°C)
Humidity:.....0 to 95% NC

Shelves

24-48V 5-Mod 23" shelf part number: 030-900-20

Mechanical
Dimensions:
mm:.....88.4H x 584W x 304D
in:.....3.48H x 23.0W x 12.0D
Weight:.....10.4kg (23.0lb)

Features
CAN bus communication
Optional integrated CXCI controller
+/- Input busbar integration with standard 3.6kw and 3.1kw systems

Standards

Safety:.....CSA/UL C22.2 60950 (NRTL)
CE IEC/EN 60950
EMI:.....Class A radiated
Class A conducted
EN 6100-4-2, -3, -4, -6
GR-1089 (where applicable)

CXDF 24-48/2kW 23", 5-module shelf

RS485
RS232
INEX
INEX

INEX Inverter System

Argus offers the latest technology in inverters to the telecommunications market. The INEX inverter is a fully integrated inverter system specifically designed for backup of critical AC loads.

INEX systems provide reliability and flexibility through pure sine wave AC power output and an N+1 redundancy design, and offer protection of connected equipment during power failures with an optional static transfer switch that transfers power automatically in less than a quarter of a cycle.

A friendly interface displays real time information, making the management of settings quick and easy. The INEX monitoring software supports stand-alone or networked computers making the inverter series a leader in the industry as the most versatile modular system for critical telecommunications backup power.

INEX™ System
48V Modular Inverter System

48V Modular
Inverter System

- Versatile modular design provides flexibility for different power applications
- Expandable capacity up to 24KVA with N+1 redundancy configuration
- “All master” dynamic mechanism eliminates single point failure to optimize reliability
- Hot swappable operation allows module addition or removal without powering down
- High power density and high efficiency

The INEX inverter series is an integrated telecommunications power system, including inverter, static switch, LCD display controller, and interface modules. With a versatile “building block” design and N+1 redundant configuration, the INEX inverter system facilitates complex telecommunications and industrial power demands, and provides ultimate flexibility for your current and future power requirements.

N+1 parallel redundancy allows power capacity expandable up to 24KVA. INEX “all master” dynamic mechanism automatically shares and re-organizes critical loads to prevent interruption should any inverter module fail. The DSP-microprocessing controller gives real-time system status through a comprehensive LCD display, and allows programmable settings through the display panel. With a communication interface module installed, you can further control and monitor the system remotely.

Inverter Module

The INEX inverter module provides pure sine wave AC power output for critical telecommunications equipment. Adopting N+1 redundancy design, the INEX inverter can operate up to 24 units in parallel. The INEX inverter module is specially designed with compact size of maximized power density and can reach up to 5.57W/inch^3 for INEX 1000 and 8.36W/inch^3 for INEX1500. A 1U height design allows the module to be installed onto a standard ETSI 300mm Rack. The INEX module is a revolutionary telecom power solution in terms of maximum flexibility and reliability.

- Pure sine wave
- Hot swappable replacement in shelf
- High efficiency >88%
- DSP design for higher system reliability
- Lower audible noise <55dBA
- Smart fan speed control
- N+1 redundancy system, load sharing difference < 5%
- High power density
- CAN bus interface embedded
- -48VDC Telecom system application
- Wide operation temperature range, -20 to 70˚C (-4 to 158˚F)

STS Module

The INEX STS (Static Transfer Switch) module increases system reliability by automatic power transfer between the inverter output and the AC mains. By setting up the priority of operation mode, users can change the system status of “on line mode” or “off line mode”. The on line mode will keep the input power provided by the inverter line and when the inverter fails, the line will switch to AC utility line. In off line mode, the system power is always connected to the AC utility line and will switch to inverter power line when AC utility fails. The transfer time is less than a quarter cycle which prevents power interruption. The reliable performance of the INEX STS module provides maximum protection to connected telecommunications equipment against possible damage caused by system power failure.

- Universal input range
- Hot swappable with MBS option
- Back-feed protection
- Redundant fan design
- Redundant power supply design
- Operation Priority Setup of transfer side by setting in control module
- Fast transfer time, typically less than ¼ cycle
- Wide operation temperature range, -20 to 70˚C (-4 to 158˚F)
- Lower audible noise <55dBA
- No-cross connect
- Optional maintenance bypass switch function
- CAN bus interface embedded

Controller Module

The INEX controller module allows users to monitor the system status in real time. Its superior design enables users to manage the inverter and STS module ‘status’ including voltage, current, frequency, capacity and temperature. With a user-friendly interface design, users can easily manage the inverter and STS module ‘settings’ including voltage, frequency, redundancy (for inverter module), and priority (STS module). The controller module can also record the alarm history which can help to understand the operating status while maintaining the system or making further adjustments to improve system performance.

- CAN bus protocol for module communication
- Relay contact output for customized alarms
- Hot swappable design
- Real time clock embedded
- Comprehensive LCD & LED for status display
- Audible alarm function

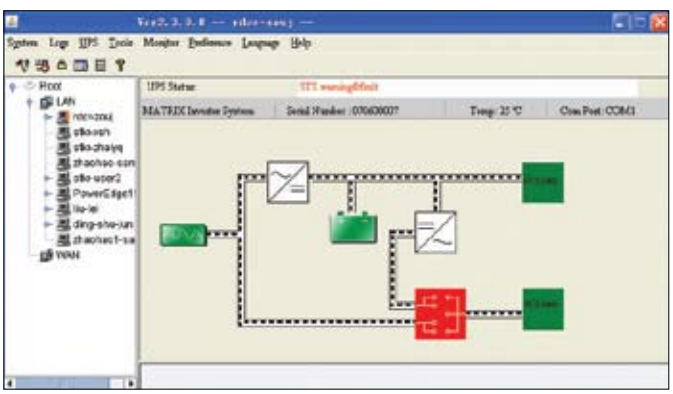
Communication Interface

The communication interface includes several options for wider applications which facilitates the remote managing to the system. The standard ports include relay contacts, RS-232, RS-485 and USB. Relay contacts provide five programmable settings to display customized information. RS-232 & USB ports provide the serial connection to the PC for software monitoring. RS-485 provides a long distance connection for direct monitoring.

- Relay contacts
- RS-232
- RS-485
- USB

WinPower Monitoring Software

WinPower is a monitoring software which supports either a stand alone computer or network connected computers.



- Real time monitoring of each module in the inverter system
- Panoramic views of all the related information; utility power, system status, and STS status
- Auto search function with any inverter power modules in LAN
- Password security protection
- Comprehensive installation (and uninstallation) process

Electrical

Inverter Module

DC input:

Nominal voltage:	48VDC
Operating range:	40.5VDC ~ 58VDC
Input protection:	Reverse polarity protection
Psophometric noise voltage:	≤1.0mV ITU-T O.41 (16.66~6000Hz)

AC output:

Power rating:	1000VA/800W, 1500VA/1200W
Waveform:	Pure sine wave
Power factor:	0.8
Nominal output voltage:	110/115/120VAC, 208/220/230/240VAC
Voltage variation:	Max ±2%
Output frequency:	50/60Hz
Crest factor:	3:1
THD:	<3%, linear load <5%, non-linear load
Efficiency:	Min 88%
Isolation AC-enclosure:	Basic isolation (Pri-Gnd) 2121VDC/1min
Dynamic response:	<±10%
Over load protection:	1.5*Inom >20s 1.25*Inom temperature controlled

STS Module

Input:

Over voltage threshold:	Adjustable between 127 to 138VAC for 120VAC systems, the default value is 132VAC 233 to 252VAC for 220VAC systems, the default value is 242VAC
Under voltage threshold:	Adjustable between 100 to 114VAC for 120VAC systems, the default value is 108VAC 176 to 209VAC for 220VAC systems, the default value is 198VAC
Backfeed protection:	Comply with safety requirement
Redundant power:	Startup power-on by priority
Design:	Source or alternative

Output:

Nominal output voltage:	Same as utility or the output of inverter modules
Permissible frequency area:	Max. +/-2.5% (inverter synchronization)
Transfer time:	Typical ¼ cycle
Rated power:	50A for 110/115/120VAC & 208/220/230/240VAC
Operation methods:	Inverter priority/mains priority

Environmental

Operating temperature:	-20 to 70°C (-4 to 158°F) -5 to 58°C (23 to 122°F) with full performance
Storage temperature:	-40 to +85°C (-40 to 185°F)
Humidity:	90% RH non-condensing
Audible noise:	55dB

Controller Module

Input:

Nominal voltage:	48VDC
Operating range:	30VDC ~ 72VDC
Over current protection:	2A fuse

Human interface:

LCD:	Resolution (line X array) 4 X 16 charactor
LED indicator:	3 colored indicators for normal, warning and fault display
Alarm:	Audio alarm when inverter, STS, controller module operate abnormally

System parameter:

Baud Rate:	Setting controller com port baud rate
Keypad tones:	Setting keypad tones
Time & date:	Setting current time and date
Setting password:	Setting system password
Brightness:	Setting LCD brightness
Default:	Change current system parameters to default value

Mechanical

Inverter Module

Dimension:

mm:	270D x 215W x 43.8H
inches:	10.63D x 8.46W x 1.72H
Weight:	2.5kg (5.5lb)

STS Module

Dimension:

mm:	270D x 215W x 43.8H
inches:	10.63D x 8.46W x 1.72H
Weight:	2.0kg (4.4lb)

Controller Module

Dimensions:

mm:	277D x 87.9W x 43.5H
inches:	10.9D x 3.46W x 1.71H
Weight:	1.0kg (2.2lb)

Hot-swap Chassis

19/23" mounting brackets

Inverter chassis

Dimension:

mm:	329.5D x 440W x 44H
inches:	13D x 17.32W x 1.73H
Weight:	2.5kg (5.5lb)

STS & controller chassis

Dimension:

mm:	329.5D x 440W x 44H
inches:	13D x 17.32W x 1.73H
Weight:	3.4kg (7.5lb)

Communication Interface

RS-232×1:	Communicate with PC
RS-485×2:	Communicate with supervision
Dry contact×5:	Communicate with external monitor
USB×1:	Communicate with PC

Standards

UL, CE, RoHS

ALPHAGEN
VOLT METER
OUTPUT INDICATOR
OVERLOAD ALARM
CHECK THE POSITION OF THE VOLTAGE SELECTOR SWITCH
FUEL VALVE

Generators

The AlphaGen™ curbside DC generator system is specifically designed for outside plant communication networks requiring -48VDC power. DC generators allow for minimal battery backup installation while still providing extended runtime to critical loads.

Every DC generator system incorporates industry leading power technology, including: natural gas or propane powered engine generators, exclusive audible noise baffling, remote status monitoring features, and durable weather resistant enclosures.

AlphaGen™ offers quiet operation, small size, and low profile for easier installation in populated areas. Generator systems have several built-in safeguards to protect the system, operators and the public.

Alpha offers a full line of AlphaGen™ systems specifically designed for telecommunication applications.

AlphaGen™
DC Generator System

AlphaGen

- Cost effective extended runtime solution for telecom powering applications
- Quiet operation, small size, and low profile allow for easier installation in populated areas
- Eliminates large quantities of batteries otherwise required for extended runtime
- Designed for stand-alone or collocated powernode applications
- Built-in safeguards to protect the system, operators and the public
- Safe unattended operation designed to UL2200, NFPA 37, 54, 58 and 70 standards

All Models

Gas inlet pressure:.....0.5 to 2 PSI inlet pressure (see note 1)
Ign charger voltage:.....13.5VDC
Ign charger current:.....6A max
Remote interface length:.....75ft max
Distance depends upon proper installation, de-rating and wire gauge (see note 2)
Agency compliance:.....UL1778
UL2200
NFPA 37/54/58/70
CSA C22.2 No.107.1
EMC/FCC Part 15 Class A
Fuel system, controls & monitoring:.....The controls and fuel system meet applicable sections of NFPA 37, 54 and 58 for automatic unattended operation of remotely located generators. Full system control and status monitoring included.
Sensors:.....Gas hazard
Pad shear
Water intrusion
Tamper

Safety shutdowns
All models:.....Low oil pressure
Over temp
Low fuel pressure shutdown (propane only)
Water intrusion
Pad shear
Gas hazard (propane or natural gas)
Over speed
Over crank
Optional feature:.....Cold start kit: Provides additional starting capability at temperatures below 17.7˚C (0˚F).

Note: Contact Alpha Technologies for the following:
1. Low pressure
2. Remote interface length distance

Specifications

Model:	3.5kW			5.0kW			7.5kW
DC output voltage	39.0V ±0.5V @ no load 36V configuration			39.0V ±0.5V @ no load 36V configuration			52.0V ±0.5V @ no load 48V configuration
	52.0V ±0.5V @ no load 48V configuration			52.0V ±0.5V @ no load 48V configuration			104.0V ±0.5V @ no load 96V configuration
DC output load regulation	0.5V			0.5V			0.5V
Output current	39.0V @ 90A max			39.0V @ 128A max			52.0V @ 144A max
	52.0V @ 67A max			52.0V @ 96A max			104V @ 72A max
Engine	398CC, Air cooled, Single OHV			398CC, Air cooled, Single OHV			624CC, Air cooled, Twin OHV
	10.5hp (using natural gas fuel)			10.5hp (using natural gas fuel)			15hp (using natural gas fuel)
RPM: (variable speed)	2800 to 3600RPM			2800 to 3600RPM			2800 to 3600RPM
Acoustical noise							
dBA 10' @ 100% rated load	68.7Ave			68.5Ave			70.3Ave
dBA 20' @ 100% rated load	63.0Ave			62.5Ave			64.3Ave
dBA 10' @ 70% rated load	68.3Ave			66.9Ave			66.4Ave
dBA 20' @ 70% rated load	62.6Ave			60.9Ave			60.4Ave
System size:	**CE-3x**	**CE-9x**	**PN-4xL**	**CE-3x**	**CE-9x**	**PN-4xL**	**PN-6x**
Height (cm/in)	111.2/44	132.1/52	81.3/32	111.2/44	132.1/52	81.3/32	99/39 (144/57 with optional pedestal)
Width (cm/in)	66/26	132.1/52	81.3/32	66/26	132.1/52	81.3/32	100/39.25
Depth (cm/in)	61/24	61/24	76.2/30	61/24	61/24	76/30	61/24
Weight (kg/lb)	174/383	187/413	177/390	174/383	187/413	177/390	174/338 (168/370 with optional pedestal)
APU fuel consumption							
Natural gas: 1000BTU/Ft.^{3}:	60ft^3/hr			80ft^3/hr			156ft^3/hr
Propane gas: 2520BTU/Ft.^{3}:	0.82gal/hr			1.10gal/hr			1.48gal/hr
	30ft^3/hr			40ft^3/hr			54ft^3/hr
	3.46lb/hr			4.62lb/hr			6.24lb/hr
Exterior surface temperature:	65˚C max (149˚F) (meets requirements of UL/CSA)			65˚C max (149˚F) (meets requirements of UL/CSA)			65˚C max (149˚F) (meets requirements of UL/CSA)

CE-3x2
3.5 or 5kW

CE-9x2
3.5 or 5kW

CE-3/9G propane storage for generator (For 3.5 and 5.0kW)

PN-4xL
3.5 or 5kW

PN-6x
7.5kW
(PN-6x is not compatible with CE-3/9G)

AlphaGen™ Portable

3.0kW Portable 36/48VDC Generator System

AlphaGen Portable

- DC technology requires no ATS (Automatic Transfer Switch)
- No need to disconnect or reconnect power supply to utility power
- Selectable output for 36 or 48VDC operation up to 3000W
- Super quiet operation only 58dBA @ 7m/22ft
- Completely enclosed, water resistant for safe operation in the field
- Oversized metal gas tank with level gauge for extended runtimes of up to 20hrs

Specifications

Part number: 013-018-10-010

Engine: .....Honda GX 200 6.5hp, air-cooled, OHV, single cylinder, manual recoil starting, manual choke
Rated power: .....2800W continuous, 3000W max
Alternator: .....Permanent magnet, brushless, bearingless

Dual range selector:
36V: .....39.5VDC nominal at generator output connector
48V: .....52.5VDC nominal at generator output connector

Output regulation: 1VDC
Control features: .....Automatic voltage regulation
Electronic governor
Over current protection
Analog voltmeter with back light
Cable interface: .....Anderson type SBE-80 connector
Fuel tank: .....3.4 gallon metal tank with level gauge

Runtime:
@ 25% load: 20hrs
@ 80% load: 10hrs
@ 100% load: 7.2hrs

Audible noise: .....Approx. 58dBA @ 7m under full load
Frame: .....Fully enclosed

Dimensions:
mm: .....569H x 480W x 655D
inches: .....22.4H x 18.9W x 25.8D
Dry weight: .....Less than 53.5kg (118lb)

Agency: .....CSA C22.2 No. 100-95, 107.1-01, 107.2-M89, 0.4
FCC part 15B Class A

Required Accessories

Output interface cable: .....Available in 10', 30' or 50' lengths
Battery interface cable: .....Choose ring lung, heavy-duty alligator clamp, or Y-adapter*

*Connects the power supply's battery input directly to the generator

30' Output interface
10' P/N 877-567-10-022
50' P/N 877-567-10-021

Ring lug battery interface

Alligator clamp battery interface
P/N 874-946-20

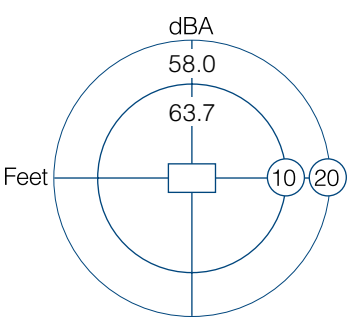
Y-Adaptor battery
P/N 874-946-22

Optional accessories:

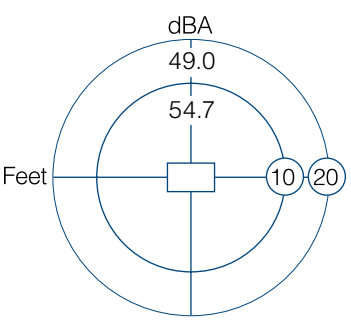
DCX-PG-WK:.....Portable generator wheel kit
AG-PG-TOOL:.....Punch tool kit for enclosures
AG-PG-UK: .....Enclosure upgrade kit
DCX-PG-HANDLE: .....Locking handle
AG-CAB-KIT.....Cable bag with cable and key lanyard

3.0kW Portable Generator Sound Levels

Ambient background noise level at 45dBA
All readings are 8 point averages



Generator at 100% rated load



Generator at 100% rated load
(typical)

AlphaGen front view

AlphaGen portable trailer

AlphaGen with wheel kit

ARGUS®
argusdcpower.com
1-888-GO-ARGUS

Enclosures

From the smallest Te25 to the largest Te21, the Argus enclosure product line provides a full range of cabinet solutions for any outdoor equipment application.

All outdoor enclosures are equipped with control systems that maintain temperatures well within the specified operating ranges of internally mounted equipment in a clean and dry environment that uses both open and closed loop HVAC technologies.

Argus enclosures provide application flexibility with a variety of adjustable components including moveable equipment mounting racks, different types of equipment mounting hardware, swing racks, slide out equipment rails, different styles of cable entrance ports and many other options and features.

When the Argus outdoor enclosure and the Cordex products are combined as a system, the result is an optimally designed, highly reliable outdoor power plant that provides easy installation and long term operation in a single outdoor cabinet design.

Argus enclosures are designed and tested to meet the highest standards of the telecommunications industry.

Tempest Te25
Outdoor Enclosure

Tempest Te25

- Designed for outdoor or secure indoor applications
- Easily transportable
- Durable aluminum construction
- Pedestal, wall, pole or rack mount
- Compact footprint

Electrical

Consult factory on AC load center options for specific equipment requirements

Enclosure Assembly

Part number: 029-003-20

Cabinet

Dimensions:
mm:.....516H x 544W x 518D
inches: .....20.3H x 21.4W x 20.4D
Weight: .....29kg (65lb) approx without customer equipment

Options:.....Wall mount
Pole mount
Pedestal mount
Rack mount
AC distribution
Meter base
Generator connector and transfer switch
GMT fuse block
Surge arrestor
Rack space: .....19" rails, 11RU

Other Information

Alarm:
Connection: .....Terminal block
Description: .....Intrusion
DC connections:.....Multiple connection
Chassis ground:.....Multiple connection
Buss bar located in cabinet
Security:.....Padlockable front door

Standards

CSA:.....C22.2 No 60950-01-03
UL:.....Std. No 60950-01
Cabinet:.....NEMA type 3R (CSA C22.2 No 94-M91)
Seismic:.....Designed to meet Zone 4 requirements

Related Components

Heating & Cooling:
Optional DC fan cooling option (standard design is vented with filters)

Tempest Te25xh
Outdoor Enclosure

Tempest Te25xh

- Designed for outdoor or secure indoor applications
- Easily transportable
- Durable aluminum construction
- Pedestal, wall, pole or rack mount
- Compact footprint

Electrical

Consult factory on AC load center options for specific equipment requirements

Enclosure Assembly

Part number: 029-006-20

Cabinet

Dimensions:
- mm:.....914H x 544W x 518D
- inches:.....36H x 21.4W x 20.4D

Weight:.....41kg (90lb) approx without customer equipment

Options:.....Wall mount
Pole mount
Pedestal mount
Rack mount
AC distribution
Meter base
Generator connector and transfer switch
GMT fuse block
Surge arrestor

Rack space:.....19" rails, 20RU

Other Information

Alarm:
- Connection:.....Terminal block
- Description:.....Intrusion and high temp

DC connections:.....Multiple connection
Chassis ground:.....Multiple connection
Buss bar located in cabinet
Security:.....Padlockable front door

Standards

CSA:.....C22.2 No 60950-01-03
UL:.....Std. No 60950-01
Cabinet:.....NEMA type 3R (CSA C22.2 No 94-M91)
Seismic:.....Designed to meet Zone 4 requirements

Related Components

Heating & Cooling:
Optional DC fan cooling option (standard design is vented with filters)
Optional air conditioner

Tempest Te15
Modular Enclosure

- Modular design for single or multiple cabinet configurations
- Welded aluminum construction
- 39RU of rack space
- Heating and cooling options
- Compact footprint

Tempest Te15
Side mounted AC distribution
and top compartment

Electrical

Input voltage: ..... 120/240VAC 200A 1 Ø
120VAC 100A 1 Ø
Number of breakers: ..... 18 max
Transfer switch/
generator connector:..... Optional
TVSS:..... Optional

Mechanical

Part number: 030-699-20

Top Compartment
Dimensions (optional):
mm:..... 203H x 813W x 813D
inches:..... 8H x 32W x 32D

Main Compartment
Dimensions:
mm:..... 1753H x 813W x 813D
inches:..... 69H x 32W x 32D

Solar Shield
Dimensions:
mm:..... 76H x 813W x 813D
inches:..... 2H x 32W x 32D
Rack space: ..... 23" rails, 39RU

Other Information

Alarm:
Connection:..... Terminal block
Description:..... High/low temp
Intrusion
Chassis ground:..... Multiple connection
Buss bar located in bottom of cabinet
Security:..... Padlockable doors

Standards

CSA:..... C22.2 No 60950-01-03
UL:..... Std. No 60950-01
Cabinet:..... NEMA 3R
(CSA C22.2 No 94-M91)
Seismic:..... Designed to Zone 4 requirements

Related Components

Heating & Cooling:
Heater:..... 600W
Air conditioning: ..... Up to 8000BTU
Fan cooling:..... Optional
Heat exchanger:..... Optional

Tempest Te17
Outdoor Enclosure

Tempest Te17
(shown with 5000BTU air conditioner, bottom compartment, and solar shield)

- Designed for outdoor network applications
- Easily transportable
- Durable welded aluminum construction
- Variety of configurations possible with 23RU of space
- Compact footprint

Electrical

Consult factory on AC load center options for specific equipment requirements

Mechanical

Part number: 030-729-20

Main Compartment
Dimensions:
mm:.....1092H x 762W x 711D
inches:.....43H x 30W x 28D

Bottom Compartment
Dimensions:
mm:.....356H x 762W x 711D
inches:.....14H x 30W x 28D

Solar Shield
Dimensions:
mm:.....25H x 762W x 711D
inches:.....1H x 30W x 28D

Complete Enclosure Assembly
Dimensions:
mm:.....1473H x 762W x 711D
inches:.....58H x 30W x 28D
Rack units:.....23" rack 23RU
Weight:.....204kg (450lb) approx without customer equipment

Other Information

Alarm:
Connection:.....Terminal block
Description:.....High/low temperature
Intrusion
Chassis ground:.....Multiple connection
Buss bar located in cabinet
Security:.....Padlockable doors with socket pin-head key

Standards

CSA:.....C22.2 No 60950-01-03
UL:.....Std. No 60950-01
Cabinet:.....NEMA type 3R (CSA C22.2 No 94-M91)
Seismic:.....Designed to Zone 4 requirements

Related Components

Heating & Cooling:
Contact factory on HVAC options for specific environmental conditions

Tempest Te17
(shown configured to customer specification)

Tempest Te20
Power Enclosure

Tempest Te20

- Available in 24VDC (34.1kW) and 48VDC (39.6kW)
- Designed for outdoor wireless applications
- Air conditioned battery and customer equipment compartment
- Fan cooled DC power equipment compartment
- NEMA 3R rating

Electrical

Input voltage: 120/240VAC
Connected direct to site AC distribution panel
Option to mount external AC panel

Mechanical

Part number: 030-765-20

Enclosure
Dimensions:
mm: ..... 2137H x 762W x 762D
inches: ..... 84H x 30W x 30D
Weight: ..... 379kg (828lb) no batteries

Other Information

Alarm:
Connection: ..... Terminal block
Description: ..... High/low temp
Intrusion
Chassis ground: ..... Multiple connection
Buss bar located in bottom of cabinet
Security: ..... Padlockable doors
DC distribution: ..... 1 x 1200A 20 position bullet breaker
4 x 600A load shedding capability
Batteries: ..... 3 shelves 4 battery/shelf
Customer equipment: ..... 7RU available

Cabinet Back-up Capacity

Number of batteries: 12
Battery amp hour:
A hr each: 150
Runtime (@25˚C/77˚F to 175VPC 24V)
20 min: 1246A
2 hrs: 332A
4 hrs: 185A

Standards

CSA: ..... C22.2 No 60950-01-03
UL: ..... Std. No 60950-01
Cabinet: ..... NEMA 3R (CSA C22.2 No 94-M91)
Seismic: ..... Designed to Zone 4 requirements

Related Components

Heating & Cooling:
Heater: ..... 600W (optional)
Air conditioning: ..... Up to 5000BTU (battery compartment)
Fan cooling: ..... Power compartment

Tempest Te20b
Battery Enclosure

Tempest Te20b

- 10 strings @ 24VDC, 5 strings @ 48VDC
- 1200A Buss
- Designed for outdoor wireless applications
- Optimum back-up power source
- Environmentally controlled
- Compact footprint

Electrical

Input voltage: ..... 120 or 240VAC single phase (air conditioner)
Output voltage:..... Battery cabinet
24 or 48VDC
Recommended
feeder breaker:..... 15A time delay breaker

Mechanical

Part number: 030-780-20

Cabinet
Dimensions:
mm:..... 2137H x 762W x 762D
inches: ..... 84H x 30W x 30D
Weight: 318kg (700lb)

Enclosure
Aluminium shell
Steel internal battery shelving

Battery Shelf
Dimensions:
mm:..... 300H x 549W x 546D
inches: ..... 11.8H x 21.6W x 21.5D

Environmental

Outdoor temperature: ..... -40 to 46˚C (-40 to 115˚F)

Other Information

Alarm:
Connection: ..... Terminal block
Description: ..... High/low temp
Intrusion
DC connections:..... Multiple connection
Buss bar located in bottom of cabinet
Security: ..... Padlockable doors

Standards

CSA: ..... C22.2 No 60950-00
UL: ..... Std. No 60950-2000
Cabinet:..... NEMA 3R (UL50)
Seismic:..... Designed to Zone 4 requirements

Related Components

Heating & Cooling:
Optional heater:..... 600W
Air conditioning: 5000BTU

Tempest Te21
Modular Enclosure

Tempest Te21

- Modular design for single or multiple cabinet configurations
- Welded aluminum construction
- Dual compartment system
- Compact footprint
- Up to 39.6kW @ 48V or 34.1kW @ 24V
- Multiple point cable access

Electrical

Input voltage: 120/240VAC
Connected direct to site AC distribution panel

Mechanical

Part number: 030-778-20

Enclosure
Dimensions:
mm: ..... 2137H x 762W x 762D
inches: ..... 84H x 30W x 30D
Weight: ..... 392kg (863lb) no batteries

Other Information

Alarm:
Connection: ..... Terminal block
Description: ..... High/low temp
Intrusion
Chassis ground: ..... Multiple connection
Buss bar located in bottom of cabinet
Security: ..... Padlockable doors
DC distribution: ..... 2 x 1200A 20 position bullet breaker
4 x 600A load shedding capability
Batteries: ..... 2 shelves 4 battery/shelf
Customer equipment: ..... 8RU available

Standards

CSA: ..... C22.2 No 60950-01-03
UL: ..... Std. No 60950-01
Cabinet: ..... NEMA 3R (CSA C22.2 No 94-M91)
Seismic: ..... Designed to Zone 4 requirements

Related Components

Heating & Cooling:
Heater: ..... 600W (optional)
Air conditioning: ..... Up to 5000BTU (battery compartment)
Fan cooling: ..... Power compartment

Radium MiniBay
Environmentally Controlled Enclosure

- Scalable, environmentally controlled enclosure system
- Fully integrated system and agency certified
- Ideal for remote optical transition applications
- High capacity 24 or 48VDC 3000BTU (879W) DC powered air conditioner
- Natural gas or propane DC generator system supports critical communications
- Reduces operational and recurring costs

Radium MiniBay

Nominal Specifications

Environmental rating:.....NEMA 3R when configured with door mounted fans and filter system
NEMA 4X when configured with heat exchanger or air conditioning system

Seismic rating: .....Consult factory. A seismic rating is based on a set system configuration with defined mounting locations and equipment types

Design standards:.....Following NEC & Telcordia Technologies (Bellcore) GR-487, GR-63 and GR-108 guidelines

Compliance:.....Third party approval from National Recognized Testing laboratory (NRTL)

Equipment Enclosure
Dimensions:
mm:.....812D x 2740H x 1936W
inches:.....32D x 44H x 30W
Weight:.....88.5kg (195lb)

Battery Storage Module
Dimensions:
mm:.....812D x 904H x 1936W
inches:.....32D x 14H x 30W
Weight:.....59kg (130lb)

Riser Module
Dimensions:
mm:.....812D x 904H x 1936W
inches:.....32D x 14H x 30W
Weight:.....46.3kg (102lb)

Side Chamber SC1
Dimensions:
mm:.....775D x 812H x 3330W
inches:.....12D x 72H x 32W
Weight:.....45.4kg (100lb)

Side Chamber SC2
Dimensions:
mm:.....775D x 812H x 3330W
inches:.....12D x 72H x 32W
Weight:.....40.4kg (89lb)

Material:.....High strength corrosion resistant aluminium
Finish:.....Almond color powdercoat finish

Fans and Filters

The most basic thermal management system supporting the MiniBay utilizes conformal-coated, variable speed and alarm monitored fans with electrostatic air filters providing up to 500W thermal dissipation. This configuration has a NEMA 3R rating.
- Variable speed controlled DC fans continue to operate during a utility outage
- Conformal-coated fans
- Electrostatic and washable air filters
- Field replaceable fans

Heat Exchanger

An airtight rear door and a heat exchanger equipped hinged front door providing over 500W thermal dissipation. With a 500W load, the internal ambient temperature will not exceed 9.4 to 2.7°C (15 to 27°F) above external ambient. With a 250W load, the internal ambient temperature will not exceed 7°C or 12.6°F above external ambient. This configuration has a NEMA 4X rating.
- Heat exchanger heat pipe technology provides efficient thermal transfer
- Minimizes internal temperature rise above external ambient
- Variable speed controlled DC fans continue to operate during a utility outage
- Field replaceable fans

DC Air Conditioner

For applications requiring the most reliable below ambient cooling and dehumidifying system for supporting seamless performance through extended utility outages. Cooling capacity 878W dissipated at 43°C (109.4°F) outdoor ambient allowing a Maximum* internal ambient of 40°C (104°F).
- Variable speed brushless motor 24/48VDC compressor system assures optimum efficiency over the full range of thermal loading and ambient temperatures
- 3000BTU @ 43°C/110°F Rating
- Redundant conformal-coated fans have >50000hrs of life and low voltage disconnect circuitry

AC Air Conditioner

Ideal for applications requiring cooling and dehumidifying with little or no standby runtime performance. Cooling capacity 1464W dissipated at 43°C (109.4°F) outdoor ambient allowing a Maximum* internal ambient of 40°C (104°F).
- 5000BTU @ 43°C/110°F Rating
- Washable electrostatic filters
- 240VAC

* Reducing the internal dissipated heat load reduces internal ambient.

Tempest Te30
Multi-functional Enclosure

Tempest Te30RE

- Modular enclosure design for mid size applications
- Provides multiple enclosure line-ups including power, battery and radio equipment installations
- Air conditioning, fan cooling and vented options available
- Nema 3R rating (IP55)
- Multiple cable access points

Electrical

Input voltage.....120/240VAC 100A 1 Ø
Generator switch/
Generator connector.....Optional
TVSS.....Optional
AC panels/breakers.....Configurable - contact factory

Mechanical

Part number 029-016-20

Dimensions:
mm:.....1483H x 762W x 762D, including 254mm plinth
inches:.....58.4H x 30W x 30D, including 10" plinth
Weight:.....Approx. 227 kg (500lb) no batteries, no rectifiers
Mounting:.....Pad or platform
Enclosure:.....Aluminum shell 5052-H32
Internal rack:.....23", 26RU

Environmental

Operating temperature:....-40 to +46°C (-40 to +115°F)
Storage temperature:.....-40 to +85°C (-40 to +185°F)
Humidity:.....0 to 95% non-condensing
Elevation:.....3600m, see operating temperature (12,000ft)
Weather tightness:.....NEMA Type 3R
Audible noise:.....44dBA @ 7 metres (23ft) (air conditioned system)

Other information

Alarm:
Connection:.....Terminal block
Description:.....High/low temp & intrusion
Chassis ground:.....Multiple connection
Security:.....Pad lockable doors

Standards

Enclosure ratings:.....CSA/UL type 3R
IP55 equivalent
Product safety:.....CSA/UL 60950
Seismic:.....Designed to meet zone 4 requirements

Related components

Cooling options:.....5000 BTU/hr. air conditioner on front door
DC fan cooling (and/or backup)
Vented
Heating:.....Up to 550W, 100-120VAC 50/60Hz

Te25

Features:
- Aluminum construction
- Pedestal mount
- Rack mount
- Wall mount
- Pole mount with ladder bracket option
- Multi purpose

- 19" rack 11RU
- AC power options
- Fan cooled or vented

Dimensions:
mm: 516H x 544W x 518D
in: 20H x 20W x 20D

Te15

Features:
- Aluminum construction
- Pad or platform mount
- Multi purpose

- 23" rack 39RU
- AC power options
- Fan cooled, vented or air conditioned (3500 to 8000BTU)

Dimensions:
mm: 1829H x 813W x 813D
in: 72H x 32W x 32D

Te25xh

Features:
- Aluminum construction
- Pedestal mount
- Rack mount
- Wall mount
- Pole mount with ladder bracket option
- Battery or equipment shelf option
- Multi purpose

- 36" rack 20RU
- AC power options
- Fan cooled, vented or air conditioned (2000BTU)

Dimensions:
mm: 914H x 544W x 518D
in: 20H x 20W x 20D

Te20

Features:
- Aluminum construction
- Pad or platform mount
- Dual compartment system
- Power in upper compartment & 20 DC breakers
- Three battery shelves and customer equipment in lower compartment

- AC power options
- Upper compartment is fan cooled
- Lower compartment is air conditioned (3500BTU)

Dimensions:
mm: 2137H x 762W x 762D
in: 84H x 30W x 30D

Te17

Features:
- Aluminum construction
- Pad or platform mount
- Optional bottom compartment
- Multi purpose (check dimensions)

- 23" rack 23RU
- AC power options
- Fan cooled, vented or air conditioned (3500 to 5000BTU)

Dimensions:
mm: 1473H x 762W x 711D
in: 58H x 30W x 28D
Dimensions include 14" (356mm) high bottom compartment

Te20b

Features:
- Aluminum construction
- Pad or platform mount
- Battery enclosure or multi-purpose
- Up to five battery shelves

- AC power options
- Upper compartment is fan cooled
- Lower compartment is air conditioned (3500BTU)

Dimensions:
mm: 2137H x 762W x 762D
in: 84H x 30W x 30D

Te30

Features:
- Aluminum construction
- Pad or platform mount
- Optional bottom compartment
- Multi-purpose
- Multiple cable entry ports (check dimensions)

- 23" rack 26RU
- AC power options
- Fan cooled, vented or air conditioned (3500 to 5000BTU)

Dimensions:
mm: 1473H x 762W x 762D
in: 58H x 30W x 30D
Dimensions include 10" (356mm) high bottom compartment

Te21

Features:
- Aluminum construction
- Pad or platform mount
- Dual compartment system
- Power in upper compartment & 48 DC breakers
- Two battery shelves and customer equipment in lower compartment

- AC power options
- Upper compartment is fan cooled
- Lower compartment is air conditioned (3500BTU)

Dimensions:
mm: 2137H x 762W x 762D
in: 84H x 30W x 30D

Fiber Power Systems

Fiber to the home is emerging as the 21st Century infrastructure for the information economy. According to the latest Render Report, the number of US homes receiving video, Internet or voice service over direct fiber optic connections redoubled over the past 12 months, after doubling the year before in 2006. This number is expected to double again by the spring of 2008.

The Alpha Group offers a complete portfolio of fiber to the home powering options with the FlexPoint line of 12VDC single-family solutions (SFU), the FlexNet line of 48VDC multiple dwelling (MDU), and the small office home office (SOHO) power supplies. All of Alpha's powering solutions are engineered to perform reliably in the most demanding environmental conditions while optimizing battery life and performance.

FlexNet™ FMPS
Multipurpose Power Supply

- Fiber-to-the-Premise UPS for Multiple Dwelling, Multiple Tenant and Small Business Unit applications
- Supports one or two MDU/SBU ONTs located up to 100ft from FMPS
- Battery management performs periodic battery capacity testing and status reporting to the ONT and customer
- Battery heater option provides extended runtime for applications in cold winter conditions
- Hybrid 16AWG and alarm cable minimizes installation labor
- Status indicators and audible alarm provide local status

FlexNet FMPS

Specifications

Part numbers:
FlexNet FMPS, 120V Line cord, 150W, 48Vdc out, -40°C (-40°F), Verizon 010-592-20-050
FlexNet FMPS, FTTX Multipurpose PS, 120V line cord, 150W..... 010-592-20-052
FlexNet FMPS, FTTX Multipurpose PS, 120V line cord, -40°C (-40°F)..... 010-592-20-053

Input
AC input voltage:.....90 to 320VAC
AC input frequency:.....45 to 66Hz
Surge protection: .....ANSI/IEEE Std. C62.41 to Category A, B, or C requirements, using a "Ring Wave" or "Combination" waveform, at a level of 6kV

Output
Operational
Output power:.....150W continuous - 170W, 10 sec max.
Output voltage:.....48 to 58VDC w/AC power
42 to 58VDC with battery
Output current:.....3.1A typical (crowbar limited beyond 5A DC)
Output power loading:.....Following GR-909 telephone lines in various states, e.g., ringing, off-hook, on-hook, data, and video operation requirements.
Ripple:.....Less than 3mVrms
Noise:.....Less than 100mVp-p
Output connection: .....Two terminal blocks accepting 16AWG, parallel connections

Local Alarms
System LED: .....Green steady = system output normal, DC output
Off = no AC or battery power
Battery LED:.....Yellow steady = system on battery
Off = normal mode
Replace battery:.....Red steady = replace one or two battery strings
Off = batteries within parameters
Replace battery A&B (internal):..... Red steady = replace one or both battery strings
Off = batteries within parameters

Remote Alarms
Connection:.....Two five position IDC 24AWG, parallel connections
Pin 1 alarm return:.....Open collector return reference
Pin 2 AC fail:.....On battery
Pin 3 replace battery:.....One or both battery strings failed periodic self test
Pin 4 missing battery:.....Less than eight batteries
Pin 5 battery low:.....Battery string voltage is less than 46.8VDC

Local - Audible Indicator
Alarm on:.....“Alarm Enable/Disable” toggle switch located on UPS
Batteries below voltage parameters

Physical
FMPS dimensions:
in:.....14W x 23.75H x 5.5D
cm:.....35.6W x 60.3H x 14D
Weight:.....11.3kg (25lb)

FMPS + shipping carton dimensions:
in:.....17W x 28.5H x 11.75D
cm:.....35.6W x 60.3H x 14D
Weight:.....13.6kg (30lb)

Battery
Battery type:.....Four or eight 7.2Ah valve regulated lead acid (VRLA) (batteries sold separately)

Environment
Operating:
With heater option: .....-40 to 46°C (-40 to 115°F) plus solar loading
0 to 95% RH non-condensing
Without heater option: ....-10 to 46°C (14 to 115°F) plus solar loading
0 to 95% RH non-condensing
0 to 10000ft (0 to 3000m) elevation
Storage:.....-15 to 85°C (-5 to 185°F)
0 to 95% RH non-condensing
0 to 50000ft (0 to 15000m) elevation

Compliance
CSA/UL 60950, EN 60950, EN 55022 class B, FCC part 15 class B, GR-63 Sect 4.2 fire resistance, GR-1089 Sect 3 emissions, Sect 4 lightning and AC power fault, Sect 7 electrical safety, CE, C-Tick, RoHS 5 of 6

Warranty
3 year repair or replace

FMPS with cover removed and two 7.2Ah battery strings installed

FlexPoint™
1230 Series Indoor 12VDC 30W UPS

- Telecommunications grade power system provides 30W of 12VDC primary and standby power for FTTx activities
- Customer replaceable, hot swappable 7.2Ah or optional 12Ah battery
- Emergency battery reserve for greater E911 availability
- Battery management system provides optimum service life and runtime
- Local visual and audible status indicators and remote alarm interface
- Coax F-style and packet cable interface options

1230 Series Indoor 12VDC 30W UPS

Specifications

Input OPS
AC input voltage:.....120VAC or 240VAC
AC input frequency:.....50/60Hz
Surge protection: .....ANSI/IEEE Std. C62.41 to category A, B, or C requirements, using a "Ring Wave" or "Combination" waveform, at a level of 6kV

Output
Operational
Output power:.....30W max continuous (ONT load)
Output voltage:.....12Vdc Nominal (battery voltage upon loss of AC)
Output power loading:.....Following GR-909 telephone lines in various states, e.g., ringing, off-hook, on-hook, data, and video operation requirements
Auxiliary input voltage:.....10.5 to 16.5VDC

Physical
Housing size:
in:.....8.75W x 7.75H x 3.0D
cm:.....22.4W x 17.7H x 7.62D
Weight:.....1.4kg (3lb)
Battery 7.2Ah: 2.6kg (5.7lb)
Battery 12Ah: 3.8kg (8.4lb)

Battery
Battery type:.....Maintenance free, leak-proof, sealed VRLA (valve regulated lead acid)

Visual Indicators
System: .....Green LED, power is available at the output (AC, battery or auxiliary)
Battery:.....Green LED, battery discharging to 25% SOC (main or auxiliary)
Green flash, At 25% SOC (main battery) the indicator begins to flash
Replace battery:.....Red LED, battery not present or failed self test
Auxiliary power source:.....Green LED, valid auxiliary power source connected

Audible Status Indicators
Loss of input power:.....Single, one second chirp
Low battery:.....Single chirp every 15 seconds at 25% SOC
Replace battery:.....Double chirp spaced fifteen minutes apart

Push Buttons
Silence alarm: .....Suppresses the audible alarm for 24 hours
Battery emergency use:.....Accesses reserve battery capacity

Agency Compliance
System: .....FCC part 15 Class B, CSA-NRTL\C (CSA60950), CE, C-Tick, RoHS to EU 2002/95/EC, Seismic zone 4 rated per GR-63

Environment
Storage temperature:.....-40 to +46°C (-40 to +115°F)
Operating temperature:
Without heater: .....-20 to +46°C (-4 to +115°F)
With heater: .....-30 to +46°C (-22 to +115°F)
Note: Operating temperatures based on AX-LONGBAT-7
Humidity:.....0 to 95%
Elevation operation max: ..10,000ft (3,000m) de-rate at 2°C per 1,000ft above 6,000ft
Elevation storage max: 50,000ft (15,000m)

Interface
DC output:.....Removable screw terminal plug accepts seven (2) 16AWG and (7) 24AWG wires
Coax F connector POS center
(no remote alarms supported)
Auxiliary DC input: .....3.5mm (OD), 1.3mm (Pin, positive) coaxial barrel connector
AC input:.....IEC320/C6 receptacle
Line cord: .....NEMA 1-15 to IEC 320 C5
(other cords available upon request)

Warranty
FlexPoint 1230: .....3 years repair or replace
Batteries available: .....1-year or 3-year

Models
FP1230-01A:.....120VAC 3-conductor NEMA 5-15 power cord
FP1230-02B:.....240VAC 3-conductor schuko input power cord
FP1230-02C:.....240VAC 3-conductor United Kingdom input power cord
FP1230-02D:.....240VAC 3-conductor Australia/New Zealand input power cord
FP1230F-01A: .....120VAC 3-conductor NEMA 5-15 power cord F connector

Supporting Options
AX-STDBAT-7:.....Battery 7.2AH AGM, 1 year warranty
AX-LONGBAT-7:.....Battery 7.2AH AGM, 3 year warranty
AX-STDBAT-12:.....Battery 12AH AGM, 1 year warranty
FP1230-CVR:.....FlexPoint 1230 12AH battery cover with strap
FP1230-HK:.....FlexPoint 1230 heater Kit
FTTH-CBL:.....ONT hook-up cable, 2x16AWG and 5x24AWG, CMX UL listed
AUX-CBL:.....Cable, auxiliary power plug 3.0m Long

FlexPoint™ AX Series
FTTP ONT UPS System

- Scalable FTTP/FTTx power supply systems with or without standby
- Full or partial outdoor configurations
- Outdoor rated including battery for 24/7 availability
- Utility meter base provides most reliable source of AC power at home
- No homeowner appointments needed for access and maintenance
- Safe, low-voltage distribution
- 30W with battery module, 24W without battery module

FTTP ONT UPS System

Nominal Specifications

Input
AC input voltage:
- AX30-12D-HC: ..... 85 to 132VAC (120VAC nominal)
- AX-30-12D-PC: ..... 170 to 264VAC (230VAC nominal)

AC input frequency:..... 50 to 60Hz
Note: International AC selections and line cords available.

Output
DC output voltage:
- PC/HC + BBPS
- (UPS system):..... 10.5 to 14.4VDC
- PC/HC (non UPS): 11.6VDC

Continuous output power:
- PC/HC + BBPS
- (UPS system):..... 30W at nominal battery float voltage
- PC/HC (non UPS): 24W
- Max output power:
  - UPS system:..... (<10s) 45W
  - Non UPS: ..... 2.4A current limit (HC/PC)
- Short circuit protection: .....Electronic
- DC ripple: 150mV

Environment
Operating temperature range:
- AX-30-12D-PC + BBPS:.....-40 to 65°C (-40 to 149°F)
- AX-30-12D-HC + BBPS:
  - HC: .....-40 to 45°C (-40 to 113°F)
  - BBPS:.....-40 to 65°C (-40 to 149°F)
- AX-30-12D-HC:.....-40 to 45°C (-40 to 113°F)
- Humidity: ..... 0 to 95% RH non-condensing
- Battery storage:.....-15 to 65°C (5 to 149°F), 0 to 95% humidity
- Elevation operation max: 10000ft (3000m)
- Elevation storage max:..... 50000ft (15000m)

Battery
Type:..... Maintenance-free, leak-proof, sealed VRLA (valve regulated lead acid)

Recharge time:..... AX-12D-BBPS-7.2: <16hrs with 24W
AX-12D-BBPS-17 load <36hrs with 24W load

Regulatory Approvals
Home converter: ..... UL-listed system, FCC part 15, Class B, EN55022, class B
Power ring:..... UL-recognized components
Power ring converter:..... UL-recognized components
BBPS modules:..... CSA

Warranty
Electronics: ..... 2 years
Battery–standard:..... 1 years
Battery–long life:..... 3 years

Status Alarms
Local (LED indicators):
- Green steady:..... Output OK
- Green blinking:..... Standby operation
- Red steady: ..... Replace battery
- Red blinking: ..... Battery missing/battery low

Remote (Status Alarms – PacketCable Compliant):
- AC fail: ..... Output power drawn from battery
- Replace battery:..... Battery has failed periodic self-test
- Battery missing:..... Battery is disconnected
- Battery low:..... Battery has 20% remaining runtime

FlexPoint UPS runtimes (mins) over temperature

7.2Ah			
Load/Temp	-40°C/-40°F	-20°C/-4°F	25°C/ 77°F
7W	360	560	800
10W	160	360	500
15W	110	195	320
18W	80	156	240
20W	60	130	210
25W	50	100	170
30W	30	80	130
17Ah			
Load/Temp.	-40°C/-40°F	20°C/-4°F	25°C/ 77°F
10W	750	1080	1240
15W	400	680	940
20W	60	440	680
25W	160	340	480
30W	140	232	400

Module Descriptions

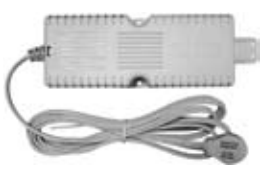
Power-Ring

Compatible with ring and ringless style meter sockets and provides a receiving socket for the FlexPoint AC to DC Power-Ring converter module. Depending on the model the Power-Ring can tap the AC power before or after the meter and comes supplied with a blanking plate.

Model: ..... 200A continuous, 240A rated
AX-POWER-RING-A (power tap after meter) — P/N 021-053-10-021
AX-POWER-RING-B (power tap before meter) — P/N 021-053-10-020
Model: ..... 320A Continuous, 400A Rated
AX-400ARING-A (power tap after meter) — P/N 021-053-10-030
AX-400ARING-B (power tap before meter) — P/N 021-053-10-031
Dimensions:
mm: ..... 120H x 178Dia
in: ..... 4.75H x 7.0Dia
Weight: 0.68kg (1.5lb)

Power-Ring Converter

Contains highly-reliable environmentally-hardened 240VAC to 12VDC converter circuitry in a pluggable housing. Outputs 24W and 11.6VDC as a stand-alone module, or supports 30W and 11.6 to 16VDC battery backup power supply (BBPS) module output.
Model: ..... AX30-12D-PC — P/N 010-318-10-034
Dimensions:
mm: ..... 209H x 51W x 51D
in: ..... 8.0H x 2.0W x 2.0D
Weight: 0.32kg (0.7lb)



Home Converter

Contains highly-reliable environmentally-hardened 120VAC to 12VDC converter circuitry in a wall mount housing. Comes with a two-conductor AC line cord and should be mounted in locations sheltered from rain or snow. Outputs 24W and 11.6VDC as a stand-alone module or supports 30W and 11.6 to 16VDC battery backup power supply (BBPS) module output.
Model: ..... AX30-12D-HC — P/N 010-318-10-39
Dimensions:
mm: ..... 209H x 70W x 38D
in: ..... 8.25H x 2.75W x 1.5D
Weight: 0.32kg (0.7lb)

Battery Modules

The Battery Backup Power Supply (BBPS) module outputs 30W of continuous power and includes a microprocessor-based battery charge management system providing the correct charge voltage to the battery over a wide temperature range, while performing periodic battery capacity testing and status reporting to the ONT and customer. The onboard battery heater provides extended standby runtimes in cold conditions to -40˚C (-40˚F). The 7.2Ah battery model provides standard runtimes and the 17Ah model provides extended runtimes.
Model: ..... AX-12D-BBPS-7.2 — P/N 031-264-10-021
Dimensions:
mm: ..... 203H x 230W x 102D
in: ..... 8.0H x 9.0W x 4.0D
Weight: ..... .68kg (1.5lb)

Model: ..... AX-12D-BBPS-17 — P/N 031-192-10-031
Dimensions:
mm: ..... 355 x 241 x 127
in: ..... 14H x 9.5W x 5.0D
Weight: 2.04kg (4.5lb)

The UPS Modules

Provides the network operator the capability to place the battery management element inside other enclosures located at the subscriber's home. UPS modules contain the same electronics used in the AX-12D-BBPS products without the battery heater and are to be used with FlexPoint Home converter and Power-Ring converter.
Model: ..... AX-12D-7.2Ah (for 7.2Ah battery) — P/N 745-816-10-023
AX-12D-17Ah (for 17Ah battery) — P/N 745-816-10-022

Batteries

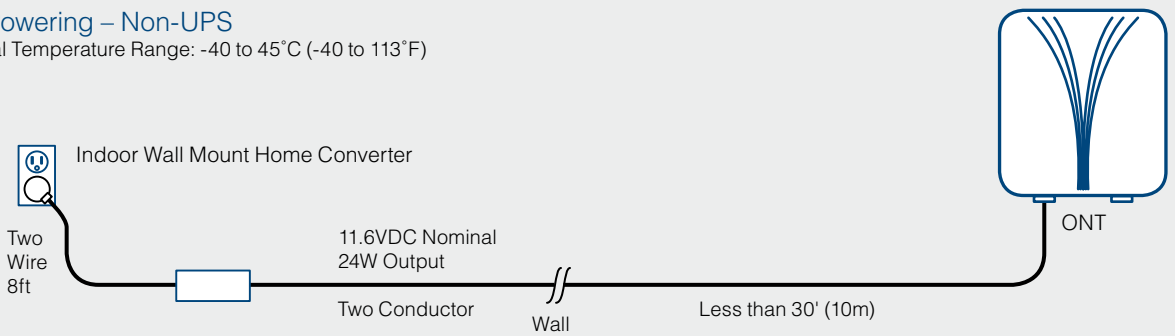
The FlexPoint AX battery modules use maintenance-free sealed-lead acid.
Model: ..... AX-STDBAT-7 — P/N 181-318-10 Standard-life 7.2AH AGM battery, 1-year warranty
AX-LONGBAT-7 — P/N 181-319-10 Long-life 7.2AH AGM battery, 3-year warranty
Weight: 2.27kg (5lb)

Model: ..... AX-STDBAT-17 — P/N 181-345-10 Standard Life 17AH AGM Battery, 1-year warranty
Weight: 5.9kg (13lb)

Applications

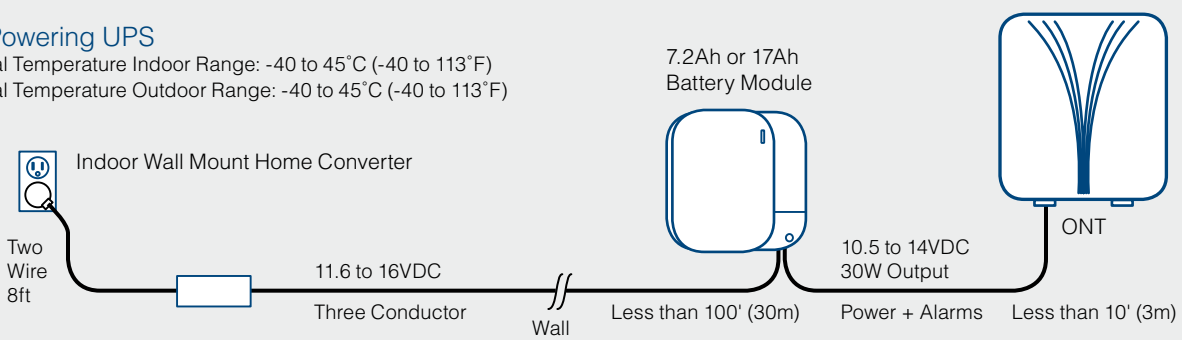
Indoor Powering – Non-UPS

Operational Temperature Range: -40 to 45˚C (-40 to 113˚F)



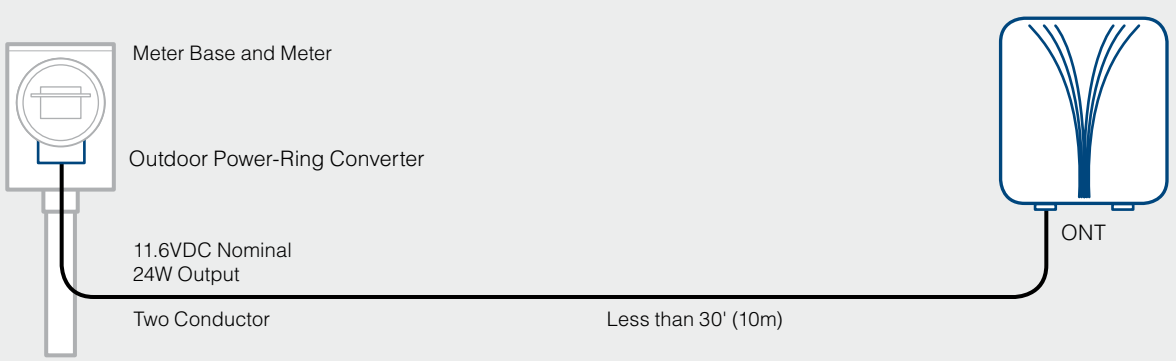
Indoor Powering UPS

Operational Temperature Indoor Range: -40 to 45˚C (-40 to 113˚F)
Operational Temperature Outdoor Range: -40 to 45˚C (-40 to 113˚F)



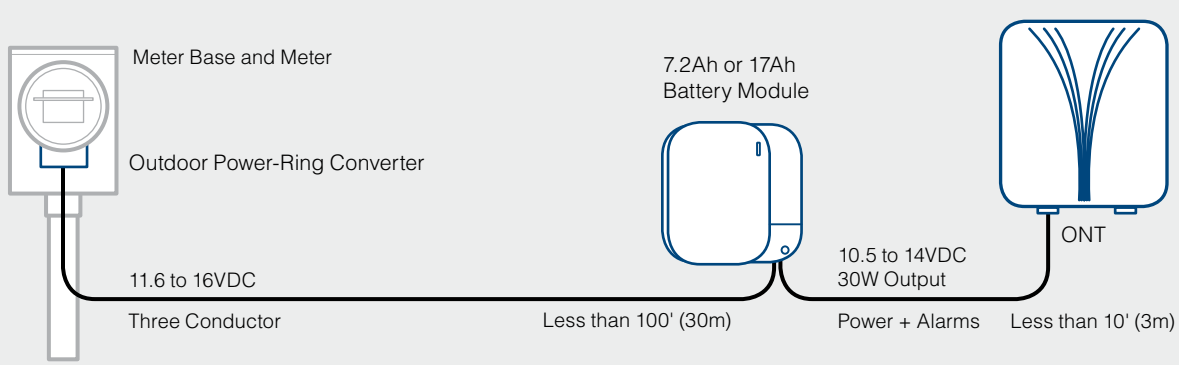
Outdoor Powering – Non-UPS

Operational Temperature Range: -40 to 45˚C (-40 to 113˚F)

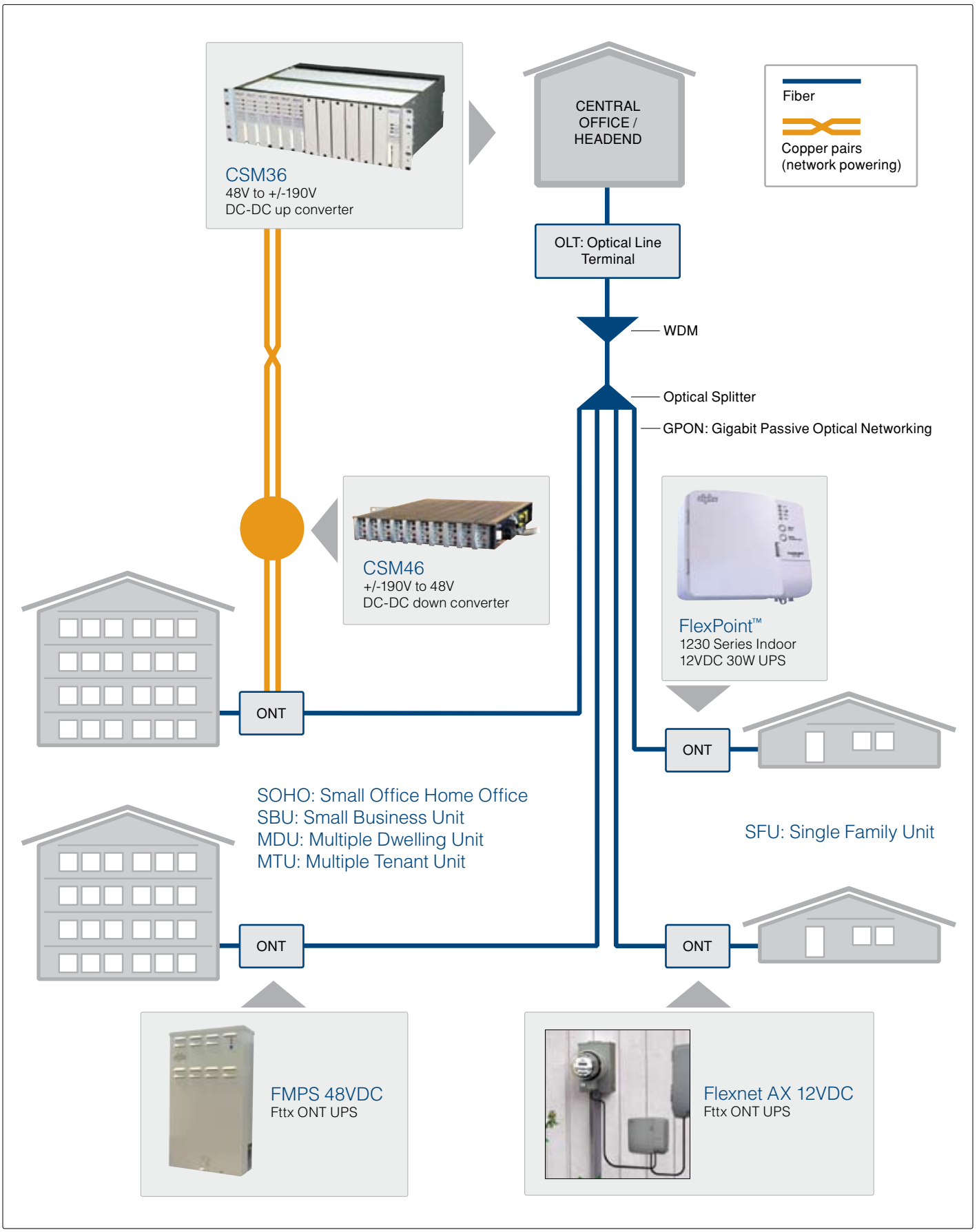


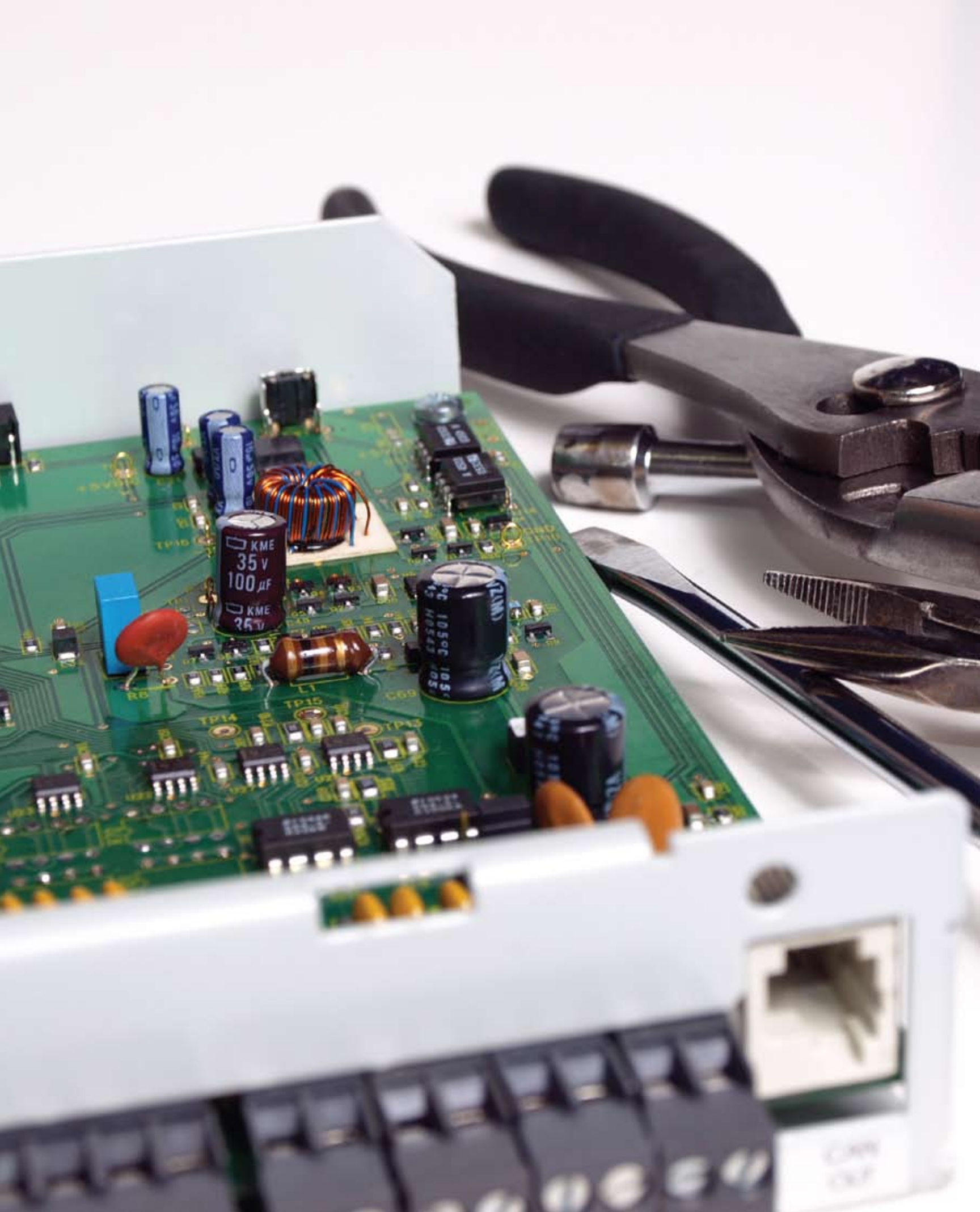
Outdoor Powering UPS

Operational Temperature Range: -40 to 45˚C (-40 to 113˚F)



FTTx
Architecture Overview




KME
35 V
100 µF
KME
TP15
TP14
TP13
C69

Services and Support

Argus' customer care services are matchless in the industry; and will help you improve productivity, work quality and user satisfaction. Our team of highly trained professionals are committed to the highest quality standards and are very knowledgeable in addressing your support requirements.

Core support components include: Comprehensive training courses, 24/7 technical support, EF&I, and full product warranty coverage. We also provide these high quality support services through a network of dedicated local centers worldwide.

First levels of support can easily be addressed through our website, 24/7 phone support, technical product documentation and customer care guides. If further support is required, custom service packages can be created to satisfy any issue. These fee-for-service options can include on-site technical support and/or training, emergency product replacement within 24 hours of request, and express repair of product within 2 working days of receipt.

Argus is always interested in delivering the best products and services, so we are constantly requesting feedback from our customers to better enhance our service levels.

Customer care services

Argus strives to provide the best customer and product support in the communications power industry, and is committed to helping customers achieve their business objectives.

Free 24-hour telephone technical support

Argus' technical support center provides expert technical support 24 hours-a-day, 7 days-a-week. All calls receive a response within 30 minutes.

Toll-free in the USA and Canada: 1 888 GO ARGUS (462 7487)
International: 1 604 436 5547
E-mail: support@argusdcpower.com

On-site technical assistance

Argus offers on-site technical assistance upon request or if the situation dictates.

On-site maintenance

Argus provides various on-site maintenance and service programs.

Installation certification

Argus provides supervision and commissioning of customer installations to ensure that products are installed and functioning properly.

Warranty coverage

Argus products are warrantied for a minimum of 24 months. A convenient repair and return plan ensures prompt turnaround of damaged products whether in or out of warranty. Products are repaired within five working days of receipt.

Several "fee-for-service" repair options are also available, including:

Express repair

Products are repaired within two working days of receipt.

Emergency product replacement

Damaged units are replaced with working units within 24 hours of request, subject to product availability.

Comprehensive user documentation

Argus products are shipped with complete installation and instruction manuals. FAQ's, technical advisories, manuals and brochures are available on Argus' website at www.argusdcpower.com.

Free software updates on the website

Engineer, Furnish and Install (EF&I)

All-in-one DC power solutions

As part of Argus' commitment to complete customer satisfaction, Argus is with you every step of the way. Argus provides complete EF & I services.

Cost efficiency, quality, and reliability

Argus' EF & I program will save you time and money, and give you the assurance you need that your project is being completely managed by experts.

Our dedicated team will plan site-specific solutions that work within your budget and operational constraints, and keep in mind your current and future requirements.

Expertise and experience

Detailed drawings, scopes of work and methods of procedure, from site surveys to commissioning, ensure accurate installations.

Argus' engineering and technical teams offer complete installation, testing and maintenance, as well as 24 hour technical support and comprehensive documentation.

With thousands of customer systems designed, built, installed, and operational around the globe, Argus has the experience and expertise to provide the perfect DC power system solution to meet your needs.

Training

Comprehensive training of Argus products

Argus offers comprehensive training covering all aspects of DC power systems including the engineering, installation, configuration, operation, and maintenance of Argus products. Training classes can be held in a traditional classroom setting or in a web-based environment that is easily capable of connecting multiple locations simultaneously.

Customized DC power system course

Courses are taught by industry experts at the Argus headquarters in Vancouver, BC, but arrangements can be made to hold classes at other locations. Instructors follow prepared curriculum or will custom tailor course material to meet the specific needs of your group. (Please refer to page 96 for more detail about the course content).

Contacts

For more information about Argus' training, please contact Argus directly or visit our website at www.argusdcpower.com.

Course Selection

Course Selection

	Course 1	Course 2	Course 3
	• DC Power System • Engineering • General Practices	• DC Power System • Installation (new/retrofit) and Commissioning • General Practices	• DC Power System • Operation, Adjustment, Maintenance & Field Repair • System Specific
Format/Duration	Tutorial 8 hours	Tutorial 2 hours Hands-on 2 hours	Tutorial 4 hours Hands-on 4 hours
Prerequisites	• Engineer or technician with minimal power experience • Basic electrical understanding (AC/DC fundamental, etc.)	• Engineer or technician with minimal power experience • Basic electrical understanding (AC/DC fundamentals, etc.)	• Engineer or technician with minimal power experience • Basic electrical understanding (AC/DC fundamentals, etc.)
Objectives	Upon completion of the course, the participants will be able to: • Design and size DC power systems and components • Understand the functionality and operation of the individual components of the DC power system • Engineer site installations for DC power	Upon completion of the course, the participant will have an understanding of: • The requirements for installing DC power systems • The requirements for commissioning DC power systems • How to work safely within a live DC power system environment	Upon completion of the course, the participants will be familiar with: • The operation and functionality of the power system and components • The maintenance requirements of the power system • The components that may be repaired in the field and how to perform the repair safely
Course materials	Overhead projector, Argus DC Power Systems Training Course Manual, storyboard, markers and miscellaneous course materials	Overhead projector, Argus DC Power Systems Training Course Manual, storyboard, markers and miscellaneous course materials	Laptop computer, overhead projector, customer specific documentation, storyboard, markers and miscellaneous course materials (power system, multimeters, load bank, etc.)
Course outline The following topics will be reviewed:	• Power systems functionality and operation • Rectifiers • Batteries • Fuses and circuit breakers • Battery return bus • Supervisory and control • Low voltage disconnect • Battery temperature compensation • DC - DC converter systems • DC power systems • Inverters/UPS • Grounding network • Surge protection • Power system design and ordering • Site engineering for DC power	Initial and retrofit installation techniques for various DC power systems and components will be reviewed including: • Rectifiers • Batteries • Converters • Fuse panels • Ground bars	Review of customer specific documentation, system schematics, etc.

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DC
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ARGUS

Power

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Argus Technologies

member of The alpha Group™

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FSC Mixed Sources
Product group from well-managed forests, controlled sources and recycled wood or fiber
www.fsc.org Cert no. SW-COC-1563
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10%